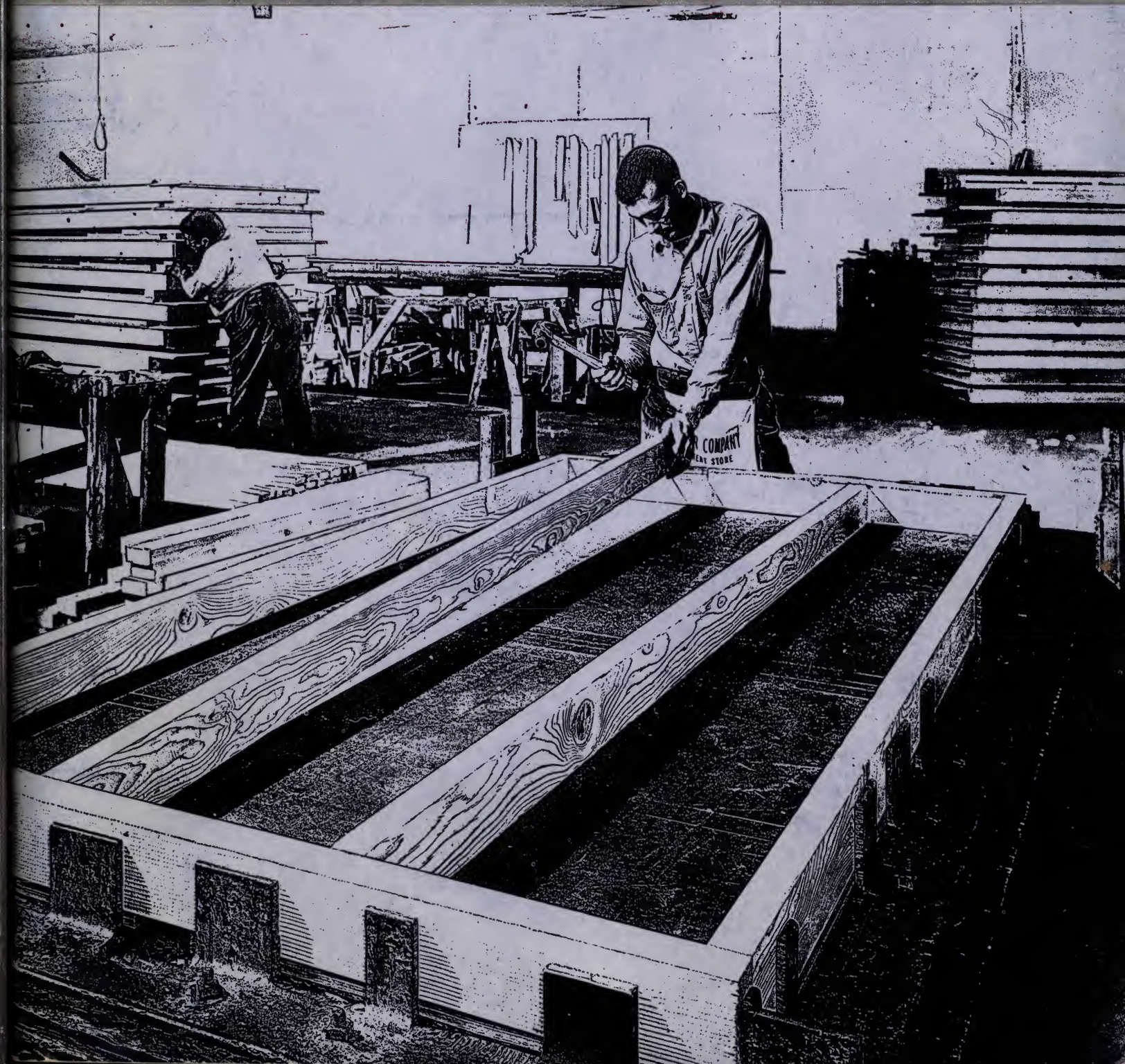


**U.S.G. ADVISORY  
SERVICE**

**COMPONENT  
CONSTRUCTION**

THE ONLY CLEAR ROAD TO LOWER COSTS

**UNITED STATES GYPSUM**





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Mike Jackson, FAIA

# COMPONENT CONSTRUCTION

THE ONLY CLEAR ROAD TO LOWER COSTS

Component house, fabricated and erected by  
Wilks Lumber Co., Monett, Mo.











# COMPONENT CONSTRUCTION

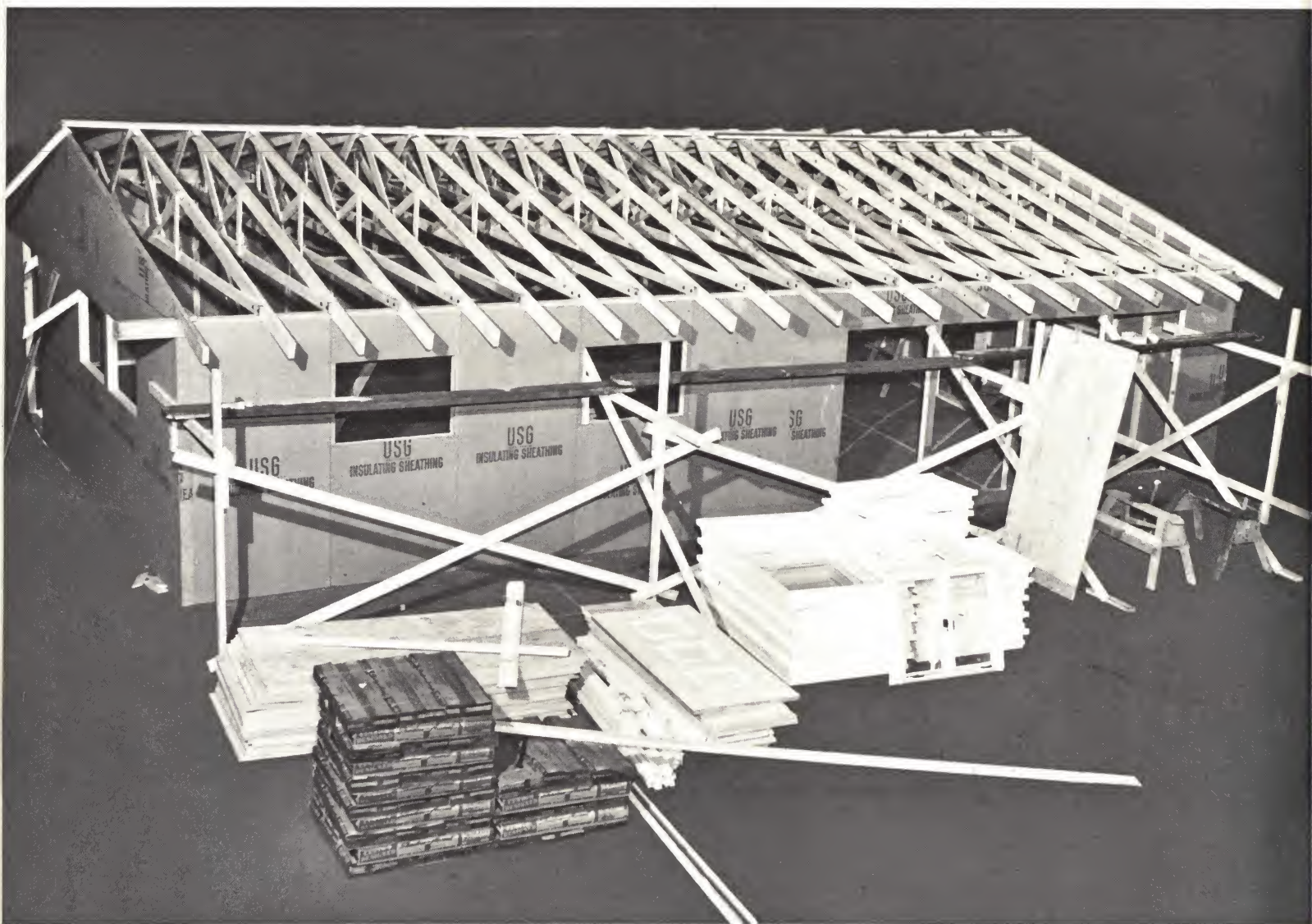
THE ONLY CLEAR ROAD TO LOWER COSTS

A guide for home builders  
and building materials dealers who are  
in the vanguard of their industry

Published by United States Gypsum Company  
with the cooperation of  
Lumber Dealers Research Council  
and National Association of Home Builders

Text by Elmer H. Johnson, creative director,  
United States Gypsum Company  
and Raymon H. Harrell, executive vice-president,  
Lumber Dealers Research Council





Packaged efficiency. Shop assembly of many house parts by the retail lumber dealer has helped builders reduce their selling price per square foot, in spite of increasing labor and materials costs.



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## FOREWORD

*This is the seventh in the series of U.S.G. Advisory Service programs developed to help builders and dealers participate individually in the steady progress of the home building industry. Other topics treated in this series include Land Development, Profit Management, Employee Training, Shell House Construction and Materials Handling. Through these programs United States Gypsum Company recognizes the industry's most urgent problems as its most conspicuous opportunities for service.*

*The aim of this book is to help builders and dealers to relate market conditions and their existing facilities to possible entry into local component manufacture or into the components method of building.*

*It draws heavily upon the experience of pioneers in this business both in its basic text and in the portfolio of experience stories. It helps capsule important work done by such groups as the Components Subcommittee of the National Association of Homebuilders and the Lumber Dealers' Research Council, the latter having put into the hands of local lumber dealers the first tangible means of participating in the growing trend toward component construction.*

*Assistance in reviewing this text came from such men as Ralph Johnson, Milton Smithman and John King of NAHB while Raymon Harrell, executive vice-president of Lumber Dealers' Research Council collaborated directly with the editor, supplying information, photography and sources which were invaluable. The help of these men is gratefully acknowledged.*

— UNITED STATES GYPSUM



## INTRODUCTION TO COMPONENTS

THE COMPETITIVE advantage of being able to offer more features and floor space per dollar than the neighboring builder has inspired many homebuilders to remarkable accomplishments of cost control. The success of these men is such that even in a period when their costs per man hour of labor have increased as much as 60 percent, they have been able to hold their selling prices for houses relatively stable.

These conditions have developed a generation with exceptional versatility. The builder's daily problems are those of land acquisition and planning, local building regulations, finance, cost control, purchasing, merchandising, selling and modern structural engineering and methods. Seldom, any longer, does he have time to be over his shoe tops in the mud or dust of his building site. His headquarters is his swivel chair, and from it extend the lines of communication and command that keep an important business enterprise operating smoothly.

Among other things, the builder has had to become a careful buyer of the multitude of materials which he combines into finished homes; and as the jaws of the trap created by rising costs and competitive selling prices have tightened around him, the builder has shopped with increasing care for the lowest price on each item he must buy consistent with necessary quality. This, in turn, has created new problems and new conditions for the retail lumber and building materials dealer, the builder's traditional source for most of his purchases. Many dealers who have adhered to time-honored selling methods have seen either their profits or their sales volume taper and decline.

Matching rising costs with relative price stability has been achieved primarily through ingenuity, displayed both by progressive builders and leading building materials dealers.

Component construction is a major example of this type of accomplishment, and the more-house-per dollar trend can be expected to continue, at least until all the budding possibilities of the component construction idea have bloomed and been plucked.

\*T.M. Reg. U.S. Pat. Off.

Those materials dealers and builders who begin now to explore and exploit this new avenue to reduced costs will enjoy the greatest measure of local competitive advantage. In fact, as is true in every changing industry, the only significant area of competitive advantage is the lead time before the multitude of average businessmen adopt the new method or merchandise. The lead time for trusses is almost past. It is still ripe for most other component units.

This book is a guide for those who wish to profit by marching up front in the component parade before it passes them by. It deals not in theories, not in dream products of the future, but with those component items which are now available locally, and are practical for use by large and small builders alike. A dealer or a builder can move into the component picture at his own pace. He can adopt as many or as few of the available components as rapidly as his organization can absorb them with profit.

### DO COMPONENTS REALLY SAVE MONEY?

The very definition of a building component implies savings. A component is an assembly of units fabricated under controlled and efficient shop conditions for erection at the construction site with minimum site labor.

Savings begin as the component is made. Assembly or manufacture is accomplished under conditions created for convenience and quality control, with power tools and an organized work flow, and in some cases with lower cost semi-skilled labor. Layout is pre-engineered on the drafting board.

Job-site savings originate with the better use of labor there. The ability to close in a house in one day relieves labor of further dependence on weather. Expensive hand-crafting by skilled carpenters is minimized. Cutting and trimming is reduced (eliminated is the aim) as is the waste and scrap material that results.

An interesting example of component savings was revealed in two identical apartment buildings in which partitions were erected two ways. Conventional stud erection and the hanging of SHEETROCK\* wallboard in







The clock tells the story of progress made in a single working day of 45 man hours by a six-man crew. This component house was built in Chehalia, Wash. by Northwest Lumber & Millwork Supply Co. Foundation was complete before the timed work started. Box beams support the panel floor, which was in place within 15 minutes after work began.







one apartment required 76 man hours. United States Gypsum's STRUCTICORE\* factory-made partition panels did the same job in the duplicate building in 12½ man hours. The absence of nails in the STRUCTICORE partition face panels also reduced time needed for finishing.

### ADMINISTRATIVE COSTS REDUCED

In some cases the administrative advantages of component construction are almost more important to the dealer and builder than the operational advantages of house erection.

A shortened building period reduces construction loan interest, and the promise of an early move-in date is a sales advantage.

Known costs and faster estimating provide more accurate cost control, and often more competitive pricing. Quality control is improved because plumb walls and 90-degree corners are more easily attained with precision jigs and machines than with hand labor on the job site. This "fixed" quality, recognized by FHA, appeals to mortgage lenders and may speed loan approval and code acceptance.

Establishment of a components plant is also a possibility for many builders. The pioneers are those who build a sufficient number of houses each year to make the investment pay off handsomely. Others have set up a shop in spite of more modest volume because local dealers have not met their demand for component parts.

Most experienced builders state their preference for purchasing rather than manufacturing the items which go into their houses. Even those who have established their own components shops or plants are quick to assert that if they could find a local source for similar house parts, made efficiently so that they could be sold at reasonable prices, they would quickly abandon their own manufacturing function. Supplying a single building operation from a components plant means that house unit costs can edge upward at an alarming rate if volume drops faster than overhead at the components plant.

The implications of panel manufacture in a dealer's

shop reaches into every phase of his operation. For example, some panel shops can keep versatile crews busy with productive work even when their services are not needed for their normal yard function. In slack seasons, standard panels can be fabricated and stockpiled. Labor costs practically evaporate when these units are made on time which would otherwise be non-productive.

Perhaps most important of all to the dealer: his builder-customers are no longer shopping for bits-and-pieces. They are unit or package customers. The dealer quotes a package price for the entire collection of materials and specialty items required for a house. The dealer can offer services such as scheduled deliveries, supply technical assistance to a builder who is erecting his first panelized house, and offer floor plan service for a group of houses on which prices are pre-figured.

Shop efficiency permits the dealer to sell his builder-customer the entire house package at a better price than scattered buying could provide, while the dealer realizes a satisfactory profit on a longer list of items than he would otherwise sell. (See page 21.)

### PITFALLS OF THE COMPONENTS BUSINESS

With all of the advantages of component construction, a builder and dealer must also recognize some of the demands created by this better way to build. A component building operation requires basic direction by a true management-caliber individual who can lead workmen to change life-long work habits. A hostile or skeptical crew can negate the potential advantages of the system. Purchasing, delivery, and scheduling must be reorganized and streamlined to serve best the new methods at the job site.

Savings created by component methods can be lost by old-fashioned, careless handling methods. Delivery-damaged components represent far greater loss than ordinary damaged building materials.

But these mechanical or handling problems are not the ones that give pause to those dealers who already have their components shop running. Mechanical problems are

\*T.M. Reg. U.S. Pat. Off.

Interesting and varied design possibilities can be achieved readily with component construction. Only a few extra rules are added to the game of residential design by this method, and none of these need be limiting factors to creative work.



Component house in Champaign, Ill.



Component house in Baton Rouge, La.



Headquarters of the Ohio Lumber Dealers Association, built with panels and trusses in Columbus, Ohio





within their control, and they can correct any that exist. Most of these dealers have derived great satisfaction from discovering their own capacity to organize a smooth and efficient production facility, and in having nice, neat, close-fitting components come out of their shop.

Their major concern is sales. Distributors, trying to sell components through their dealers, have a hard time arousing interest among their dealers. Dealers have the same problem with builder-customers. One dealer drew a parallel with the man on the street corner trying to hand five dollar bills to passersby. He found few takers, because his offer seemed too good to be true.

Dealers tell of making a presentation of the idea and the system to a builder or meeting of builders and gaining enthusiastic response. When the dealer returns to get the program started, the customer has cooled—he is too busy, he wants to think about it some more.

In a few cases, builders are forcing retail lumber dealers into the home building business, creating new competition for themselves. Through price buying, by expecting the dealer to supply financing during construction and aid in obtaining customer financing, and by turning their backs on the dealer's component package, builders make the dealer wonder why he shouldn't reduce his problems by doing the whole job for people who come to him about new houses.

It is obvious that in the present market, component construction offers many favorable answers to dealers' and builders' problems, but is no panacea. A company that is floundering and foundering for lack of good business judgment or practices will not find salvation through adoption of component manufacture. In fact its demise could be hastened by such a venture.

### **TABOOS REMOVED**

In its earliest stages, component construction seemed to serve only the most conventional segment of housing. One by one the technical obstacles have been removed by the wisdom of builders and the ingenuity of engineers and designers.

Today there are few taboos. Window walls are possible, but floor-to-ceiling glass areas are not easily achieved with components. Some structures featuring unusual angles or exceptional design characteristics can be constructed conventionally with less cost than with components.

In reality, the technology to solve any of these problems is well within reason. Volume demand is the key to moving forward with the research needed to eliminate them.

Contributing to the component construction trend is renewed interest and genuine progress toward more universal modular construction. The UNICOM method developed by the National Lumber Manufacturers Association, has applied the basic engineering methods of modular coordination to principal construction forms that are found in the majority of residential structures. The first UNICOM manual is by far the most readable and most easily understood application of the modular coordination principle published to date. It deserves study by anyone interested in the advantages of coordination.

Long ago the industry more or less standardized dimensions for concrete block, ceiling tile, wallboard and other sheet material. Full modular coordination awaits an initiating force. The manufacturers await customer demand from their dealers and builders. Dealers and builders await availability of products, design leadership from architects, and public acceptance of such features as exposed or batten-covered joints. A true analysis of costs by builders, dealers and architects would reveal spectacular savings that could give the modular coordination idea new motivation. And complete modular coordination would be a major stimulant to component construction.

Some day builders and dealers will look back to methods which today we call conventional with the same nostalgia that railroad buffs reserve for a steam locomotive. The movement to total component construction for the subdivision house has become inevitable. Those who share this view are moving into their future by building and using available components in their current business.

Let this book be your guide to components, today!



# Portfolio

EXPERIENCE WITH COMPONENTS

**The Everitt Story**

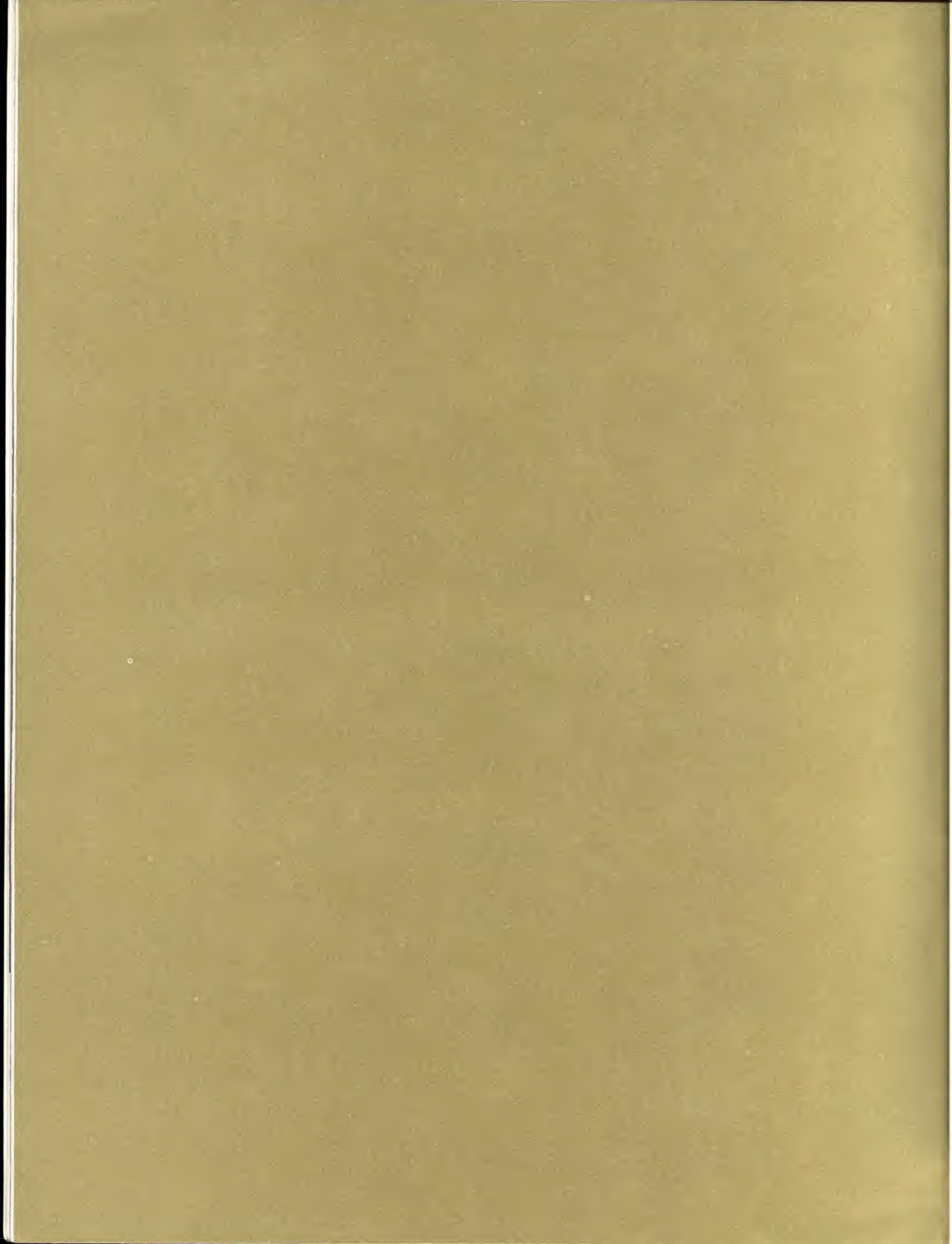
**The Davidson Story**

**The Ruston Story**

**The Southport Story**

**The Bolinger Story**

**The Riverside Story**





# The Everitt Story

Everitt Lumber Company of Ft. Collins, Colo. started its component business because of a problem that is common to many retail building materials dealers. To stay competitive, and at the same time maintain a reasonable profit margin, Everitt needed to offer materials or methods that would help its builder-customers keep costs and prices compatible with the local market for houses.

Everitt's answer was a \$350 investment in a truss jig, an investment which grew in four years to include a \$100,000 component factory separately incorporated as Union Manufacturing & Supply Co.

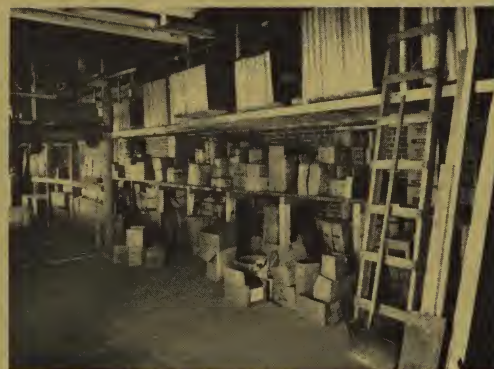
Union Manufacturing & Supply Co., Inc. has long since ceased to sell trusses or panels. Rather it sells house packages to builders which incorporate, in addition to the necessary panels and trusses, most other materials to complete the house. This includes not only such lumber dealer staples as asphalt roofing, gypsum wallboard, flooring and trim, but bathroom accessories, floor tile, vent fans and lighting fixtures. The builder sees a list of the items he will receive in the package he buys, but none of these items is individually priced. Only the package carries a total figure stating cost. This way he gets a better buy in labor and materials combined, while Everitt companies sell at a profit every item they wish to sell in the house package.

As Everitt's component business has increased, so has the number and variety of services offered to builders by Union Manufacturing & Supply Company. The company provides house plan service with pre-priced houses, ready for rapid manufacture. A staff designer-draftsman is available to alter these standard plans or adapt others for panelization.

A Union expert helps builders get started with their first component houses. Delivery loads are coordinated and scheduled to meet the builder's convenience. The crane on the Union truck elevates roof trusses to the top of the erected panels so that the builder's crew can nail them in place as they are delivered. And allowing no detail to slip, an Everitt financial expert not only helps builder-customers expedite construction loans through local financing sources, but even aids some customers with bookkeeping and money management. The latter service helps to keep Everitt and Union customers capable of meeting their bills.

Les Everitt, chairman of Everitt Lumber Company, says that his company's best periods of growth and success have come when they have faced problems and then applied themselves to working out logical solutions. Their components operation is an example. "We are glad," he adds, "that we are into this as soon as we are. We only wonder why we did not start five years earlier."

This shed, now converted back to storage, was the site of the first Everitt component operation. Here, with a \$350 investment in a truss jig, the company began to show local builders how truss roofs save money and improve quality.



Within a year Everitt leased this abandoned depot and gained space needed to install jigs to make wall panels, as well as to increase efficiency of truss production.



Four years after the inception of the truss-making operation, Everitt built this new components plant to house its now incorporated Union Manufacturing & Supply Company. The current investment is a well-justified \$100,000, and this plant fills orders from ten Everitt lumber yards, shipping most by truck, but some by rail.



Union Manufacturing & Supply has the young, hard-driving management talent it needs embodied in Art Shaffroth. Operation of this company is his sole responsibility.



## The Ruston Story



One of the larger speculative homes built by Ruston Lumber Co., Ruston, La., in their own subdivision. Component parts were used.



Ruston's subdivision includes this man-made lake which offers choice home sites.



Ruston Lumber Co., Ruston, La. used its component facility extensively for building low-cost houses. When the market in this price bracket tapered, owners W. A. and Richard Jones turned attention to the higher-priced house market where, in their area, they discovered certain resistance to the component idea.

Their investment in their component shop is not so great, however, that a few days or weeks of idleness of these facilities creates concern. They have no thought of withdrawing from the component method, and anticipate further expansion of the idea as the house market in the Ruston area regains more normal levels.

The Jones brothers have also experienced some reluctance to adopt components among the contractors they hire for the erection of houses they sell or build on speculation. Their carpenters are unique in insisting that they can frame a house conventionally in equal time. A local building code which requires bolting the bottom plate of the panel to the slab does reduce speed. (Bolinger Lumber at Bossier City, La. solved a similar code problem by building their panels with a 1x4 bottom plate, with studs extending two inches below it. Before panel erection, 2x4 plates are bolted to the slab and the 1x4 plates on the panels are nailed to these, as the panels go up.)

The Ruston Lumber staff is impressed with the smoothness and ease with which panels and trusses can roll off their assembly jigs. They know this is the direction residential building must go, and are determined to continue their part in moving it in that direction.



# The Davidson Story

## A Distributor offers Components to Dealers

Davidson Sash and Door Co., Inc., Lake Charles, La. has manufactured millwork and distributed it and other building materials to retail lumber dealers for many years. According to S. D. Davidson the company entered component manufacture about three years ago to help keep its dealer-customers strong and competitive in a changing market. Through Davidson's willingness to pioneer and invest in this component manufacturing facility, all of the company's approximately 500 dealer-customers are prepared for the inevitable shift to component construction, and automatically have the capacity to provide such components in their individual trading areas.

Davidson sales people have not found it easy to get their dealer-customers to accept and merchandise component parts. The company presentations have convinced some dealers of their own potential for using or selling the system, but their enthusiasm cooled quickly as the pressure of day to day business absorbed time they might give to a more penetrating examination of this new method. Davidson's selling efforts with dealers include showing them how they, as a dealer, can make \$850 profit on the sale of an 800 sq.-ft. house priced about \$5500. This profit is in addition to \$225 also realized by the dealer, but earmarked for selling expense and advertising.

With Davidson's encouragement, some dealers have added a salesman to sell component houses to builders or the public. On a straight commission basis, these men have little income during the early period while they are trying to introduce the basic idea to the market, and often become discouraged. After this experience the dealer seldom attempts to go further with it. But with all of the disappointments, Davidson is making steady progress. In six weeks following December 1, six new component dealers were added, each with a model house.

Davidson produces three lines of houses in the company's Jennings, La. components plant managed by Richard Boisture. The "Cottage" line is houses of 400 to 640 sq. ft., the "Mastercraft" line ranges from 572 to 1176 sq. ft., and the "Custom" line from 1000 to 2136 sq. ft. Plans are developed by Davidson designers, and while modifications are discouraged, they can be accommodated in manufacture.

Dick Boisture champions large panels, but not so large that they cannot be handled manually. He feels that with small panels, inaccuracies and tolerances accumulate to major proportions along the length of a wall. Panels leave his shop accurate to within 1/16-in. in 40 feet.

Davidson panels have male and female ends, so that there is never a crack between panels — joints always fall over a joist or stud where they are nailed tight. Siding is applied in the jig, except for brick veneer houses. Panels are built on two calibrated tables: one 50-ft. long, the other 30-ft.

Roof and floor sheathing is precut before it goes to job. On this table workman can cut three and four pieces simultaneously.



Davidson's 50-ft. and 30-ft. panel tables. This view shows tables modified for fabricating halves of 75-ft. span trusses.





Panel dolly used for moving completed wall sections.



Trusses from 16 ft. to 75 ft. are built with metal plates. The company switched from plywood gussets because plates permit hauling more trusses per truck.

Houses up to slightly more than 1000 sq. ft. can be carried on a single load. Panels are loaded vertically on one side of the truck bed, trusses on the other. Roof and floor sheathing and other miscellaneous items fill the area in the middle of the load. All items for floor and roof are precut, including sheathing.

This is the exterior package, and it is sold separately from the interior package which includes gypsum wall-board, trim, floor covering, cabinets, interior prehung doors, cabinets and other millwork, and a multitude of other items. Selling this package separately gives the dealer the option of pulling these items out of his own stock. Those who elect to do so usually buy these items through Davidson anyway.

But it is far more convenient for the dealer to buy both complete packages, because he can then be sure that every item needed for construction is delivered to the job without further detail work. And Davidson package quantities have proven to be accurate and complete.

About 40 percent of Davidson's component houses have been trucked 200 miles or more. The company makes a flat charge of \$30 per load for deliveries more than 100 miles from their Jennings, La. components manufacturing plant, realizing that they are still absorbing part of the freight to keep their dealers competitive.

A Davidson supervisor goes out with the first house to be delivered to a new dealer, and a detailed instruction sheet accompanies all loads. The objective is to keep the entire operation simple, and to make it appear simple, so that dealers and builders feel that it is easily within their capabilities.

In addition to erection aid, Davidson helps its dealers with advertising and promotion. The company abandoned a former policy of giving advertising discounts, because there was no consistency among dealers in the effective use of these funds. Now it does its own consumer advertising using radio, television and newspapers with direct reference to the local dealer. Every house has a 3 x 3-ft. job sign, and to establish identity, a distinctive insignia is common to all promotional pieces.



### Dealer experiences selling Davidson houses

J. B. McCoy Lumber Co., Monroe, La. is a retail building materials company that sells an average of one Davidson-made component house per month. They have four orders for such houses on their books at this writing. They have sold these houses in all stages of completion, meeting the local shell house market with them as well as supplying finished homes.

Duke Burlingham, of the McCoy company, says that while the profit in this business is not large, neither is the business speculative—the money is guaranteed before a start is made. McCoy has no subdivision, but has sold most houses to people who own a piece of ground and thus have an equity which is a basis for financing the project.

The McCoy company has nothing but praise for the product and service provided by Davidson. They remarked especially about the excellent fit of the components and the precise scheduling of delivery. One-day erection (floor framing, wall panels, roof sheathing and felt) is accomplished with two carpenters and two helpers, and Mr. Burlingham added that the Davidson truck driver also provided wonderful assistance on erection. The truck and driver usually stay on the job until trusses can be unloaded directly onto the erected wall panels. One-day erection nearly eliminates weather problems and pilferage, both counted as assets by McCoy. McCoy has no crews on their payroll, but have several contractors whom they hire by the job for erection. Their building contractor-customers in that area are too busy to resent McCoy's entrance into the house market with these component houses.

The Davidson Sash and Door Company is hoping to continue to add to its customer list, dealers who have the



Trusses for commercial jobs are part of the volume of the Davidson shop. These are one-half of trusses that span 75 ft.

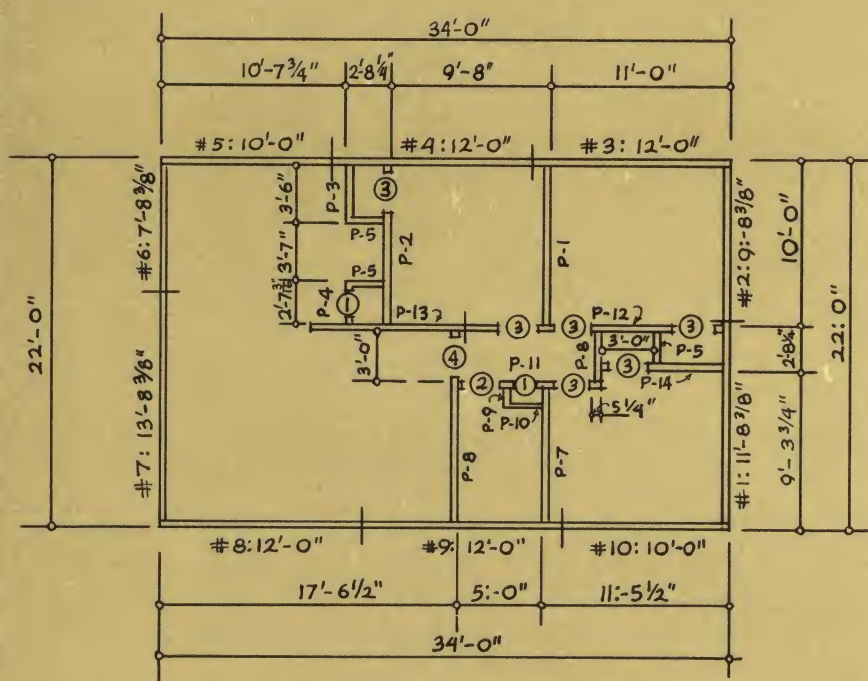
The component business is a paper business. Davidson's plant office has this rack to contain duplicated forms for production and loading and erection on each of their various house models.







A Davidson panelized utility building for customer erection.



Panelization breakdown of Davidson house.

same sense of opportunity as has been demonstrated by the men at McCoy Lumber in Monroe. Now Davidson is supplementing house volume in its component plant with commercial and other truss orders. A recent such job called for trusses with a 75-ft. span. In slack periods the shop also builds utility buildings, using 2x3's cut 7-ft. long for framing. Exterior plywood siding in 4x8-ft. panels extends down to conceal the sill of the building. The roof also consists of pre-framed panels which hook over each other for a tight fit at the ridge.

Utility buildings are offered in six standard sizes from 6x8-ft. retailing for \$158.50 to 8x16-ft. priced to the public at \$276.75, ready for buyer erection. A model in front of a dealer's store, with a sign showing the price and sizes available, develops a nice volume of business. Davidson also offers dealers a panelized, KD playhouse for which there is good demand, especially at the Christmas season.

While sufficient volume has not yet developed to afford Davidson Sash and Door a normal current profit on its component operation, the company is in it to stay, confident that they have properly sensed the industry trend and are thus preparing themselves and their customers for the inevitable switch of the majority of the market to components. "After all," says S. H. Davidson, "our first experience in selling pre-hung doors was not overwhelming. Today they are a major part of our door business."



# The Southport Story

Davidson's Southport Lumber Co., located just south of Indianapolis, once counted 22 prefabricated house manufacturers shipping products into the Indianapolis area. Southport met this competition for local home building dollars by organizing a subsidiary, Estate Homes. This company set up a \$300 jig table to build wall panels, and a more costly rig to fabricate roof trusses. Estate chose to stay away from the general public with its panels and trusses, and sought builders as customers for its service. It sold former dealers for factory-built homes as well as conventional builders, because its component method could equal or better the prices of prefabrication companies, while offering the advantages of local, personalized service.

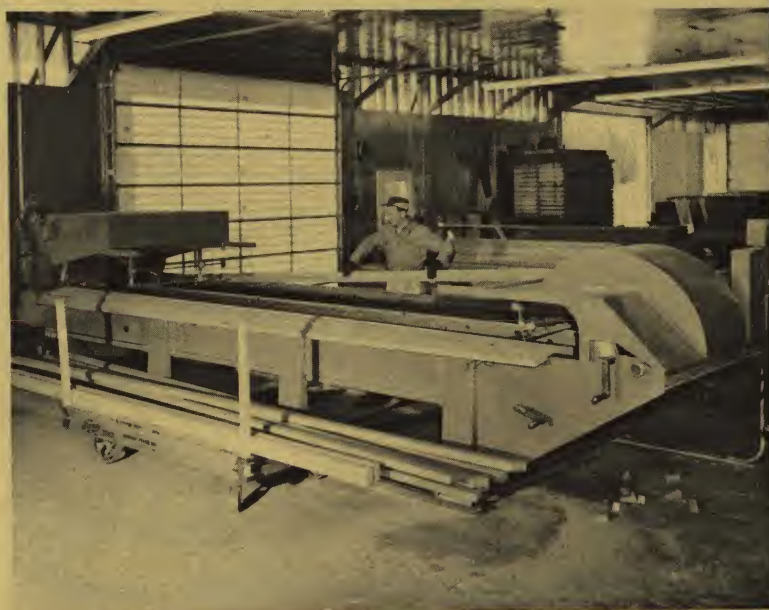
This was the story in 1956 and 1957 when the company was making its start in the component business. By 1959 it was still making only trusses, 4x8-ft. exterior panels, and pre-cut framing for interior partitions; but it had developed a nice sales volume and had a chart proving that the lumber company was supplying about 90 percent of the bill of materials on houses built by its component customers vs. 50 or 60 percent of the needs for houses built by conventional builder-customers.

The comparison of that operation to the Davidson-Southport operation of today is the comparison of a shed-type fabricator, with a 10,000 sq. ft. component manufacturing plant on a seven acre tract. Southport has a new component factory of which a high-speed component cutter is the hub. The cutter is centered in a building of many doors, with raw material flowing in at the center near the cutter, finished trusses moving out of a ground-level door at one end and finished panels out over an elevated loading dock at the opposite end of the building.

On a 50-ft. table, panels are built in 8-, 12- and 16-ft. lengths. They are made to the builder's desires, incorporating U.S.G. THERMAFIBER\* reverse flange insulating wool, siding, and sometimes SHEETROCK\* wallboard interiors if these are specified. Two 8x16-ft. jigs handle interior partitions. The cutter pre-cuts dimension for builders who merely want materials delivered in that fashion. It takes, for example, an average of just 13.8 seconds for Estate Homes to cut and band a joist into a package.

Trusses are made on a table-type jig that features extreme accuracy and can be re-set for another truss dimension in 15 minutes. As the truss is turned over, one end is fed into a roller press. One man applies truss plates to the second side as he starts and stops the roller with a foot control, and lets it pull the truss past him. Standing in one position, he can set all plates on this second side while two men reload the jig and apply plates on the first side of the next truss. This operation represents a 35 percent savings in time. The roller press is mounted in the exterior wall and feeds the truss out

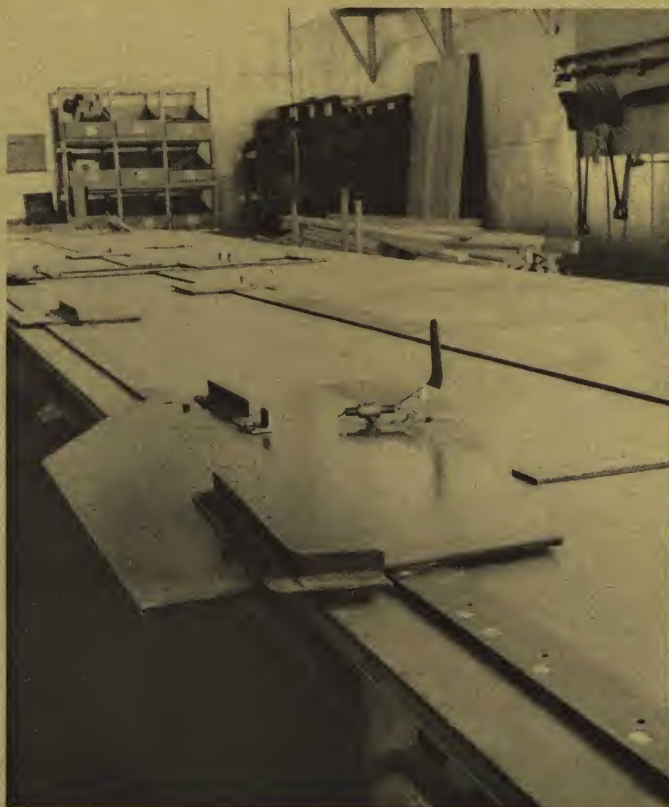
This more-than-\$10,000 component cutter revised entire cost structure of Estate Homes, Southport, Ind. permitting price reductions partially responsible for doubling company's component business in one year.



Estate Homes believes in the 8-ft., 12-ft. and 16-ft. panel, and builds them on one 50-ft. and two 16-ft. tables. The company claims greater dimensional accuracy than it formerly achieved with 4 x 8 panels.



- Estate Homes prefers table jig for assembling trusses. This simple steel plate is drilled and calibrated for quickly setting jig to any one of many truss dimensions. The company operates a flip-truss jig for gables.



Adjustable bins for storage, calibrated dimension cutting rail, and a blueprint holder that slides on a track above cutting rail are homespun efficiency items that distinguish the Estate Homes shop.



onto racks where the same man swings it into position for banding and removal by fork truck.

Volume of the components shop was good in 1961, and in 1962 it doubled that figure. This was the first winter that the shop worked steadily, including the component cutter. Two factors made major contributions to this sales record. As the home building market declined, Estate Homes invested about \$8000 in a semi-trailer and tractor equipped with a 42-ft. folding boom. Then they sought and won a large number of apartment and house jobs by offering to deliver the trusses on top of the plate of the second story level, and at no extra cost. This service represents major time savings over carrying trusses up two flights by hand. Even on a one-story house the builder-saving is estimated at 40c per truss. Estate Homes will also hoist roof sheathing, delivered on the same truck load, charging the builder \$15 an hour for this service. Twenty minutes and a \$5 charge usually does the job on an average apartment structure, and the builder has achieved another major saving. Southport feels that it will have amortized its boom truck in a year if it delivers 365 loads in that year—a one-a-day average. The company gives builders plate-top delivery free of charge if the builder supplies two men to help receive them. One man on the truck fastens the chains; the other guides the trusses as they swing over the house and settle into place. The truck driver operates the crane.

Thus, Southport sends only the driver with the load. Formerly two men accompanied it and placed the trusses on the ground. This meant payroll for a man who sat idle while he rode as much as 30 or 40 miles each direction to the construction site. The more productive use of this second man is helping Southport pay for the boom truck.

As apartment construction volume began to increase, Charles Fitzpatrick, components salesman, trained his promotional guns on an apartment builder who had been troubled with construction delays. At first he and Don Wilson, Manager of the components division, talked trusses and time savings; and when interest was aroused, discussed the full story of component savings. The builder adopted the entire package, and in the six following months completed work that had previously required 18 months. An added 12 months of rental income was the builder's reward for adopting components, in addition to certain construction savings.

Facts and figures from this job were used to win work from other apartment builders, and volume from this source has continued to grow steadily.

The second factor which contributed to Southport's major sales increase was a revamped price schedule. Prior to installation of the component cutter and other new facilities, Wilson projected his new cost scale based on efficiencies anticipated as a result of the new equipment. By reflecting these lower costs in a reduced price



CONVENTIONAL CONTRACTOR MADE 81 STOPS IN YARD TO PICK UP ITEMS HE FORGOT. THESE STOPS TOTALED A WEEK OF HIS TIME. ALL OF THESE ITEMS ARE INCLUDED IN THE ORIGINAL PACKAGE ON LU-RE-CO HOUSES.





Second story truss delivery made possible by boom truck has brought Davidson-Southport much apartment business. Truss trailer is converted auto transport truck.



Reverse flange THERMAFIBER\* insulation is shop-installed when builder wants to move that function away from the construction site.

\*T.M. Reg. U.S. Pat. Off.

schedule, it became even easier to demonstrate builder savings when comparing Southport's component construction method to conventional building.

Admittedly, market conditions for components in the Southport area are unique. This central Indiana area is the heart of the prefabrication industry, and builders and the public have been exposed for many years to the panelizing idea. Thus the Southport selling job does not face the same reluctance of the uninitiated that is found in many other parts of the nation. In fact, Wilson says that the company's eight salesmen spend little time trying to convert a dyed-in-the-wool conventional builder, because he approaches component construction seeking only faults—not searching for the advantages it offers.

Estate Homes has approached builders with the idea of converting their house designs to component construction. There is wisdom in this approach. It allows the builder to maintain the familiar while he experiments with the new method of production. It does not transfer responsibility for public salability of the builder's product back to Davidson-Southport. However, Wilson is now having some stock houses designed to take even greater advantage of component methods with resulting additional economies, while offering the good-selling, good-working features that result from professional architectural plans and elevations. These architect plans are offered as a service to builders, and their advantages will be actively sold. They will not be pushed upon the builder who wishes to supply his own plans.

Davidson-Southport has built its component business around a nucleus of about 15 builders who are consistent in their orders. Some of these build about 50 houses per year. As the housing market has declined in the past couple of years, the Southport company has held its house volume constant by winning an ever-increasing percentage of the houses built in its trading area. To this, Southport has added the apartment business described, and also built a substantial business in trusses for builders who otherwise build conventionally. The truss business is a steppingstone, contends Wilson, to selling total component packages to these builders at a later date.



Subcontractors are the major source of any sales problems encountered by the company. Some will not recognize the time savings they make when their builder-customer switches to components, and will not reduce their prices to meet their new costs. Wilson's only solution is to urge the builder to change subs. Two former Davidson-Southport employees recently established their own company—Component Erectors, offering services as subcontractors to builders who buy Estate Homes components. Estate is happy to recommend them, knowing that they understand the savings available and pass them on to their builder-customers.

Don Wilson is all ready for a worse slump in home construction than has already been experienced, should such a fate befall the market and the area. He has plans and costs in his files for farm buildings, utility buildings, and a multitude of other items that would keep his plant busy if the very bottom fell out of home construction. So far he hasn't had time to use any of them, but he likes the versatility of the business and glows with enthusiasm about its yet-untapped possibilities.

The total Davidson operation, with yards at Southport and Franklin, Ind., its component business, its sales to regular builders, its remodeling business and over-the-counter retail trade is now in excess of \$3 million annually, having tripled the figure of eight years earlier; and if the present pattern continues, the component division will soon be the source of more than half of the company's total business. Davidson-Southport likes components.

Roller press is controlled by foot-pedal to allow one man to apply all plates to second side as truss passes him. Roller is mounted in exterior wall; delivers trusses outside.



Don Wilson, left, is manager of Estate Homes, the component division of Davidson Lumber Co., Southport, Ind. Every component operation needs astute executive guidance of the type supplied by Mr. Wilson.



## The Bolinger Story

Home planning center  
in the Bolinger yard  
where customers are  
given aid with new  
house and  
remodeling plans.



Model component vacation house, on busy  
highway outside the door of Bolinger Lumber  
Co. showroom, Bossier City, La.



Bolinger vacation house interior, with "working walls."



Even large cottages supported on piers are built in the  
Bolinger shop. Note the well engineered, jig-built floor  
structure.

With five or six lakes within 60 miles of their Bossier City, La. headquarters, Bolinger Lumber Co. has developed a good business in vacation cabins built with component panels. They have done it with a model house display facing the busy highway in front of their yard, with set plans and set prices, and with service rendered to any degree desired by the customer.

The vacation house business is unique. In the first year, 22 of the units were sold for cash. Purchasers are usually people with some equity or income which permits indulgence in a second home.

Bolinger has developed a "working walls" system for some models of its vacation houses. Framing can be horizontal 2x4's or 2x6's spanning the 4 ft. width of the panel between uprights. SHEETROCK wallboard is nailed to the outside of these panels, facing in, and exterior plywood siding nailed directly over the SHEETROCK as an outside surface. The interior horizontal framing becomes shelving for books or other items, as desired. For the vacation house business, the component idea is fully acceptable to customers and builders.

The Bolinger vacation house model is 20 x 24 ft. Its price tag reads \$1399 with additional sections available at \$140 for each 4x20 ft. of additional length. Inclusion of a window in an addition adds another \$18.

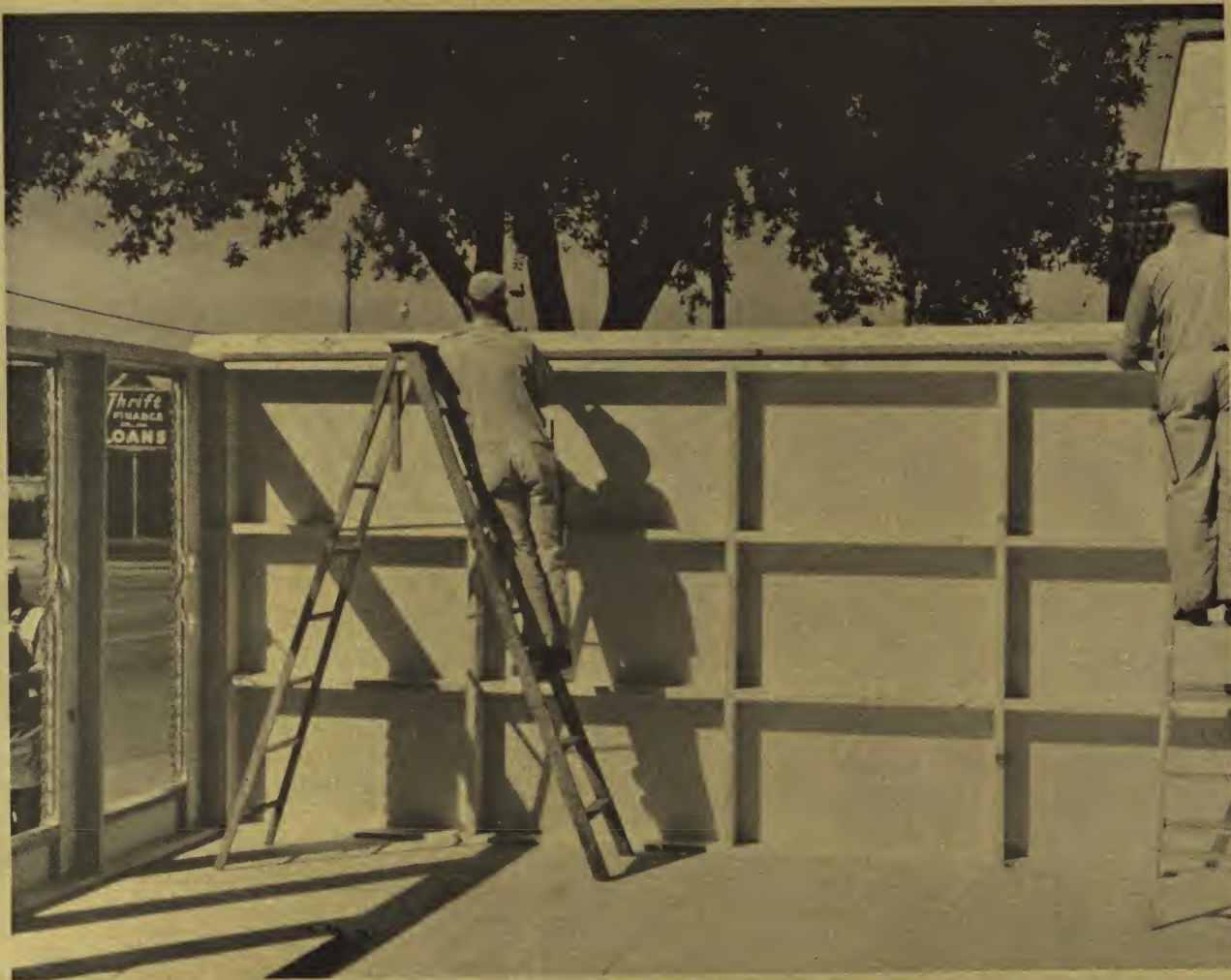
Bolinger has found that the 20 x 24 ft. model is too small. A previous one 20 x 32 ft. was more appealing, as prospects are often unable to visualize the larger size.

A prolonged slump in house demand in the Shreveport area recently has kept Bolinger's commercially-made jigs idle except for their vacation house business. Nonetheless, Harry Balcom, president, and Ed Summers, assistant secretary and treasurer, are confident that the investment in this equipment is a good one and will be fully utilized as market conditions improve and the trend toward components accelerates. And Bolinger Lumber is doing all in its power to move both factors in the desired direction.





Bolinger panels for "working walls" models carry only one stud, are nailed to the stud of the adjoining panel as erection proceeds.





## The Riverside Story

Riverside Lumber Co., Cape Girardeau, Mo. embraced component construction and started building houses to gain control of materials sales on new house jobs. According to William J. Kies, president, they had been doing most of the work of arranging financing and making other necessary negotiations anyway. Why, reasoned Mr. Kies, shouldn't they deal direct with the customer and thus be sure that all materials on the job came from their yard.

Riverside's components method of building gives them a cost advantage. The company can close a sale without the delay of taking labor bids, as they have made previous arrangements on component erection costs with all subcontractors. With four retail lumber and building materials companies in their city of 25,000 population, Riverside is proud that they supplied 100 houses built during 1962 within 50 miles of their headquarters.

Riverside subcontracts most of its on-site labor, and prefers contractors with three-man crews, with the principal working with his men. Through monthly meetings with these crews the lumber company has developed fine spirit among them and between them, so that they now aid each other on the job. The crews are well pleased with these arrangements, and like the steady flow of work that Riverside creates for them.

In its components shop, Riverside Lumber has three carpenters, with the head carpenter running the shop. These three men turn out components for 2½ houses per week, which is all the company's market has been able to absorb. In spring months the shop crew keeps busy building an inventory of standard panels, which helps to relieve the pressure of the heavy building season.

Riverside also maintains a four-man sales force at a model house located across the street from a large shopping center. One of these men is an expert estimator, another travels extensively in the company trading area, arranging financing for jobs throughout the selling territory. The company does relatively little advertising, and most of its sales result from referrals by previous and satisfied customers. Good workmanship and good values has caused the business to snowball.

Sales often begin when a customer brings in a plan. Most plans are easy to adapt to component construction.

For Riverside, controlling the sale has many more advantages than those which are immediately apparent. For example, it has enabled the company to reduce costly inventories. While they previously stocked many sizes of windows to satisfy requirements of many builder-customers, they now stock only five sizes which they incorporate into their component houses.

They now can utilize all of their purchased lumber in their shop, and even buy less-costly random lengths and make good use of all of it. Slow moving 2x4's, 12 feet long, for example, are now cut to eight-foot studs and four-foot plates for panels. The dumping of culls is a thing of the past.

Cape Girardeau's Riverside Lumber feels that it has recaptured its full measure of the new house business, and eliminated many of the problems of this business by controlling the total sale and by using efficient, component construction as its medium of construction.



## FLOOR STRUCTURE

UNLIKE the overall component trend which started with roof trusses some 15 years ago, this book on components starts at the ground, and works up.

The poured concrete slab has been the accepted base for low-cost subdivision houses in the post-war period. Several enterprising builders are seeking something better: a method that can proceed during freezing weather as well as in the warmer months. Two midwestern builders, working independently, have turned to pre-stressed, pre-cast concrete grade beams as the answer. Each is using the site and facilities of a local ready-mix plant as his supplier, but exercises control over the engineering and specific design of the beams himself (see illustrations).

Both Andy Place of South Bend, Ind. and Gale Corley of Valparaiso, Ind. caulk the joints between their foundation grade beams and create a warm air plenum not unlike plenums other builders have been achieving with poured foundations for some years. The system provides warm, dry, resilient floors, and the costs represent a saving. The crawl space simplifies plumbing and electrical work.

Corley designed a low-budget casting bed which cost only about \$5,000 to construct. Andy Place's ready-mix supplier casts grade beams in pre-stressing beds, originally designed and generally used to cast bridge and structural beams. Place and Company spans the crawl space between its pre-stressed grade beam foundations with steel Jr. "I" beams, topped with clipped-on 2x4 nailing plates. An insulation type "gasket" is laid atop the grade beams to create a seal when the plate is installed and the house erected.

As another alternate to conventional 16-inch-spaced joists for spanning crawl space or basement, Douglas Fir Plywood Association developed simple box beams fabricated from plywood and 2x4's. They gain their considerable strength from the stressed-skin principle of their design. Similar results have been achieved, sometimes more economically, with shop-fabricated beams consisting of two 2x8's, spiked together, with scabs on each side.

Wood framing over plenums suffers drastic seasonal change as the heating season affects lumber moisture content. As floor beams or ridge beams or flat roof girders, they are glued-up under controlled conditions by DFPA-licensed Plywood Fabricator Service, Inc., licensees. These companies are located throughout the United States and are accessible to almost every dealer. Component dealers can add this business if they equip themselves for it and qualify for a P.F.S. franchise.

*Complete information is contained in a folder titled "Box Beams" (form F59-1010A), in another "Nailed Plywood Box Beams" (form 62-180A), and is included in "Fir Plywood Components" (form P.F.S. 62). All are available from Douglas Fir Plywood Assn., 1119 A St., Tacoma 2, Wash.*

Most design load demands can be accommodated through varying the dimension of the stock and the plywood used in box beams. The floor beam specification provides for 50 lbs. per sq. ft., and such beams are spaced four-feet on center. Plywood box beams are lightweight (two men can handle a 24-ft. beam by hand), and have great dimensional stability.

Another modern alternate is floor trusses created entirely from 2x4's, developed by Automated Building Components, Inc., makers of Gang-Nails. Trusses which will span 22 to 28 feet are generally 16 to 20 in. deep, and are spaced 24 in. Plumbing, heating, and electrical lines run within the web of the trusses. Tests indicate that cost per house is less than with conventional floor framing and the builder gains a clean-span crawl space or basement.

*Full information is available from Gang-Nails, Box 47,836, Miami, Fla.*

Bar joists and Jr. "I" beams, do the same job in steel, and are available locally from steel supply houses.

### FLOOR SYSTEMS

The special beam systems described reduce parts in a house because fewer beams carry greater loads. With 48-in. spacing between beams, new sub-floor systems to accommodate this span are also needed. Douglas Fir Plywood Assn. offers three.

The "T & G 2.4.1 System" consists of 7-ply 1½-in.-thick 4x8-ft. plywood panels which need no edge-blocking and



Pre-stressed concrete grade-beams can be cast in a relatively inexpensive bed such as this, located at or near a local ready-mix plant. Two cables under tension run through each beam. The box down the center and the other in the foreground are dividers between beams. The form at right foreground creates a vent opening in the beam. After the concrete has set and dried, tension is released on the cables, they are cut at the end of each beam, and the beams are lifted from the casting bed by loops embedded into them during the casting process. Beams can be as long as can be transported handily.







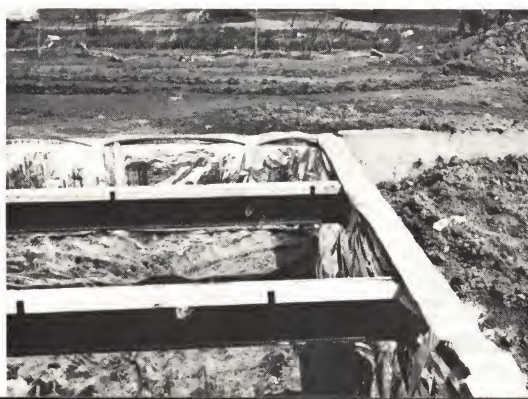
On the job, grade beams are lifted from the truck with scoop or fork lift, and placed as desired.

Pre-cast footings are screwed to the bottom of grade beams in the Gale Corley system at Valparaiso, Ind., before being lowered into pre-drilled holes.



Corley supports his beams on an adjustable sling to level them. Corners are bound with an angle iron at this point. Less than a yard of ready-mix per house is brought to the site and poured around the footings. Corley hopes to package the proper quantity of ready-mix for each footing in a polyethylene bag, bring the bags to the job on a standard truck, and break one into each hole.

Andy Place grade beams are cast in a ready-mix plant on beds also used for bridge beams. On the job, embedded tie-bars are welded together at the joints between beams and these joints caulked so that the crawl space becomes a warm-air plenum.



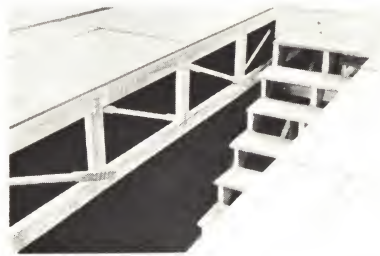
Floors of Andy Place Homes, South Bend, Ind. are supported by steel I-beams to which 2x4 nailing plates are clipped.



Box beams for floor load are glued and nailed from plywood and 2x4's; are light weight and can be spaced on 4-ft. centers.

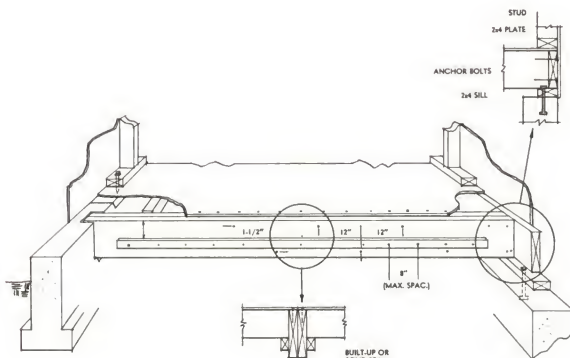
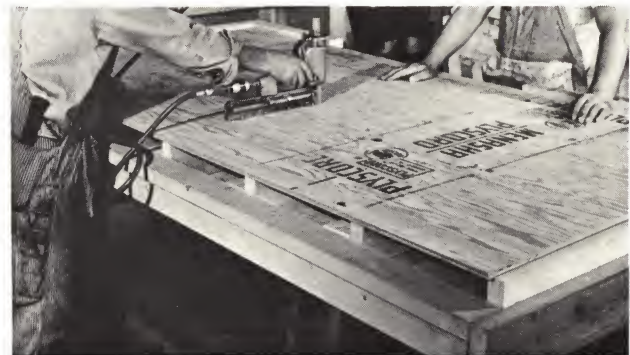


Douglas Fir Plywood's 2.4.1 system puts special 1 1/8 in. T & G plywood over beams spaced four feet.



Floor trusses created with nailing plates and 2x4's can be fabricated to carry any desired load. Pipes and ducts run within the web of the units.

Construction of Insta-floor panels, engineered by Douglas Fir Plywood Association, is done in a simple jig. Panels also span four feet. While accepted in many local areas, Insta-floor awaits FHA approval in Washington, D. C.



Two 2x8's, spiked together and supplemented with 1x2 ledger strips, create another type of economical beam for 48-in. spacing.





carry the necessary 50-lb. load spanning the 48-in. spacing of floor beams. Two men have installed more than 1,000 sq. ft. of this combined sub-floor and underlayment in under four hours. Some find its deflection objectionable.

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*Douglas Fir Plywood Assn. has a complete folder on 2.4.1 (form 60-40B).*

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Plylumber flooring combines finish-floor with sub-floor in an assembly that spans 48-in. beam spacing.

"Insta-floor" is a simple floor panel system that is said to cost less than 35c per sq. ft. in place, but has not yet won FHA acceptance. Standard 4x8 panels of ½-in. plywood are stiffened with 2x4 stringers nailed or stapled at 16-in. spacing across the 4-ft. width of the plywood. A cleat on the sides of the supporting beams carries much of the load from the 2x4 stringers, while the plywood panels meet on the tops of the beams. Of course, no extra end-bracing is needed for the panels. Panels can be fabricated on a simple, homemade jig.

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*A complete folder on Insta-floor (form 60-470B) is available from Douglas Fir Plywood Assn.*

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Stressed-skin panels will span as much as 15 ft. 10 in. when used as residential floors (carrying 50-lb. psi load). They consist of 2x6's spaced 16 in. and glued to plywood top and bottom. The bottom layer can be ¼-in. plywood and the top layer, acting as subfloor, of ⅝-in. material.

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*Form 59-1030B, available from Douglas Fir Plywood Assn. contains details on stressed-skin panels.*

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Plylumber flooring is offered by Potlatch Forests, Inc. and similar products are marketed by other manufacturers. These are laminated 12-in. wide planks, six to 20-ft. long, consisting of two plies of softwood subfloor with a third finish floor surface layer of oak, pecan or elm. Layers are offset to form tongue-and-groove edges. The ⅝-in. thickness will span up to 48 in., and the 1-5/16-in. material up to 54-in. beam spacing. The combination subfloor and finished floor is laminated as well as nailed to joists or beams. The system is said to result in a squeak-free and resilient floor.

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*A complete descriptive folder on Plylumber Flooring is available from the Bradley-Southern Division of Potlatch Forests, Inc., Warren, Ark.*

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## EXTERIOR WALLS

THE GOAL of every component-making dealer is to carry the exterior wall panel as far along the road to completion as possible before it leaves the jig. Application of insulation and sheathing to the framing is about as far as it has proved practical to go at this juncture, although some wall-length panels receive their siding in the shop. One open side permits easy joining of panels and quick installation of electrical and plumbing lines.

Each of the three ways to achieve component type "shells" for houses offers graphic display of how far we have come since the days of balloon framing and toenailing each stud to a sole plate.

The closest thing to "finished" units are tilt-up walls using pre-cut framing. They are framed full-length or in sections while lying flat on the subfloor of the house. Most builders using this method install sheathing and pre-finished siding while the framing is still horizontal.

The method is quite fast, but is practically all stoop-work. It shares with conventional construction the limitations of bad weather; nails are still in carpenters' aprons rather than in handy bins; and if automatic equipment is used, power lines have to be strung from distant outlets. Lifting the walls into place temporarily requires a large crew or a light crane, but once the lift begins, a great deal of wall is completed in a very short time. Early comparisons indicated that tilt-up construction costs as much as 25 percent more than shop panelization, so most builders started directly with shop panels.

Proponents of large panels also include the developers of the Q-system. With a flexible jig table, a system of color-coded blocks and a full scale layout tool, a builder reportedly can convert any set of house plans into component panels without drafting, sketching or mathematical calculation. The floor plan can be modular or non-modular, and the final panels will be accurate to  $\frac{1}{8}$ -inch.

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*Complete information is available from Quesenberry Component Systems, Box 204, Big Stone Gap, Va.*

One set of equipment can produce everything from a single-car garage to a \$50,000 residence, and the jig pro-

vides for panels of 1,700 different widths. It is practical to set up the Q-jig for one-time use on a custom plan.

It is said that \$2,800 will put a lumber dealer into business with the Q-system, on a house-a-day production rate. The fee covers the jig, manuals, set-up supervision and other services. This assumes that the dealer has the tools and delivery equipment common to most building materials yards, and the space to set up the jig table.

A major proponent of the dealer-built 4x8 panel as the principal exterior wall component is the Lumber Dealers Research Council. The Lu-Re-Co panel consists of three studs and 4-ft. top and bottom plates. Studs are spaced two feet, and 4x8 sheathing is hand- or power-nailed or stapled before the panel leaves the jig. Where codes require it, studs may be spaced 16 inches, or horizontal nailers may be substituted for studs when vertical siding is to be applied. Two-foot panels add flexibility to the system.

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*All information needed for a dealer to establish himself in the Lu-Re-Co components business is available through National Plan Service, Inc., 1700 W. Hubbard St., Chicago, Ill.*

Each of the basic systems deserves consideration as builders and dealers turn to component construction. Among them is one best suited to each dealer's operation.

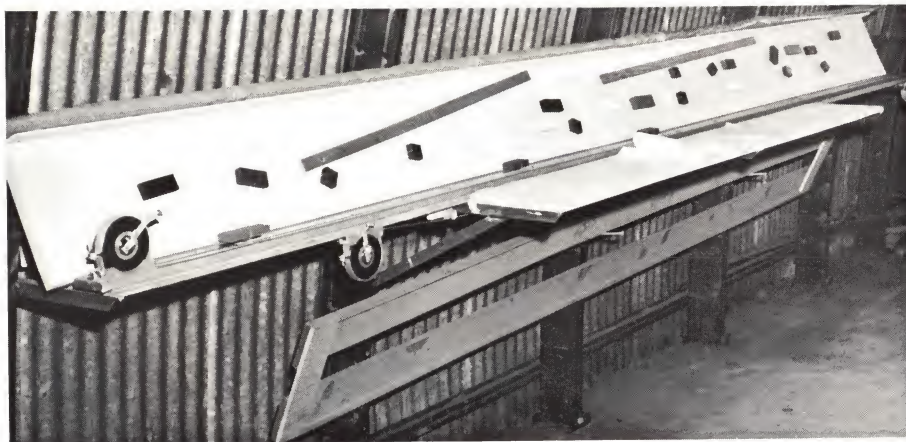
Laboratory work is continuing on exterior wall systems, and new devices contributing to their improvement are constantly being introduced. National Lock Co., for example, manufactures a joining mechanism to be built into panels.

Fully factory-made panels containing window units are manufactured by millwork companies to make installation of their window units easy and economical. This factory precision is even greater than can be achieved by a dealer with his own jig. Usually the cost of the unit to the dealer is less than the cost of a window panel made in his own shop.

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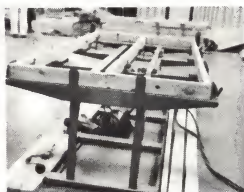
*Factory-made window panel information is available from Andersen Corporation, Bayport, Minn., and Dierks Forests, Inc., 810 Whittington Ave., Hot Springs, Ark.*





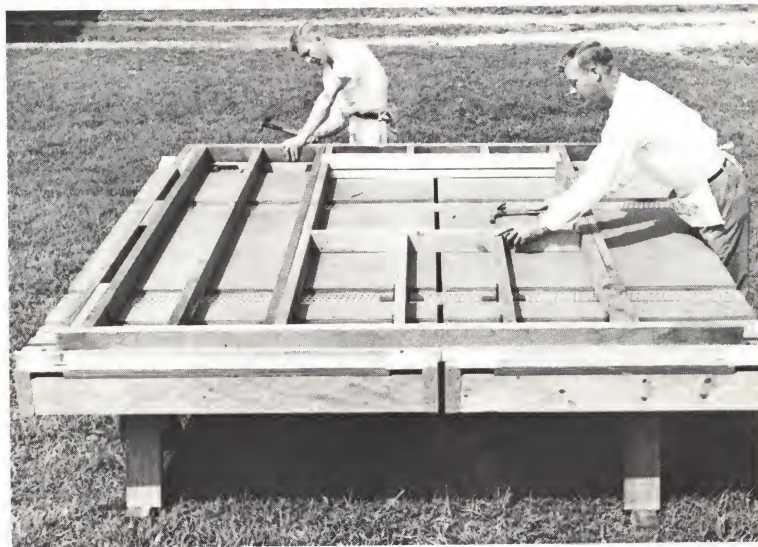
Equipment which makes Q-System operational.

This commercially-made jig for making 4x8 component wall panels is available for less than \$500. A jig can be fabricated locally for as little as \$200 from plans supplied by Lumber Dealers Research Council, but lacks some of the quick-clamp and roller features of this unit.



Headers over large openings such as garage doors or picture window units can be fabricated by dealers. These would be box beams, glued and nailed with plywood and light framing lumber. The Small Homes Council at the University of Illinois, Champaign, Ill., also has instructions for fabricating other types of headers. In some areas glued laminated beams are used in this same position.

The panelization of exterior walls is the second logical step in the dealers' fabrication business after he is established in the manufacture of roof trusses. The market for wall panels is far less saturated than the truss market, and consequently provides larger opportunities for progress and profit.



The Q-System jig makes larger panels and is said to have flexibility to permit 1700 different dimensions on the same table. It can be set for a single job and reset for a completely different one quickly and easily.





Simple flatbed truck is all that is necessary to bring panels to the job site, for stacking on the sub-floor. Truck can be loaded with lift equipment.



Component wall panels can be stockpiled in dealer's sheds if he wishes to keep crews busy in bad weather by building ahead.

In a couple of hours, three men can have the exterior walls of a house erected.







Factory-manufactured window units fit the panelizing pattern established by dealer-made wall sections. The more critical tolerances necessitated by an operating window are more easily achieved with factory-precision methods. Complete window panels made by Andersen and Dierks are shown above & below, respectively.







Panels are tied together with continuous plate, bridging the joints for additional stability.



## ROOF STRUCTURE

**THE KEY** to exploiting the full potential of the component method is a roof structure which spans the building and throws its entire weight on the exterior walls. With it, the house can be closed in quickly, so that all interior work, including partitioning, can be done without concern for weather.

The resulting space is a box, formed by exterior panels, roof and subfloor. Before confining interior partitions are erected, exterior walls are insulated, the entire open ceiling is finished and the flooring is laid without necessity for cutting and fitting around the framing of partitions, through doorways and into closets. Material waste is reduced and labor savings are present, all because of roof trusses. In addition to corollary benefits, trusses save money in their own right. They take roof framing workers off of ladders and scaffolds and put them to work under far more favorable shop conditions, with jigs and automated tools.

Little wonder then, that roof trusses were the first of the true component units introduced to home building. Today they are the most widely adopted and widely used component—and rightly so. Of all present components, roof trusses offer the greatest opportunity for spectacular savings. Because of well-engineered distribution of roof weight, trusses can be fashioned from relatively light and inexpensive dimension stock. Nailed metal plates and combination nailing-pressure application systems are the most commonly used methods of joining the framing members after they have been precision-aligned in a jig. Nailing plates (several brands are on the market) are pre-punched metal gussets attached with spiral or threaded nails. Simple jigs made of lumber, and space to turn the truss to apply plates to the reverse side, are all that is needed. Small truss makers use this system extensively. It requires many nails which sometimes cause splitting. One system, H-Brace, does not have to be turned over in fabrication.

Slightly larger fabricators install roller or punch presses for the nail-pressure system. Volume of about 3,000 trusses per year is deemed sufficient to justify this capital invest-

ment and shop space requirement. Plates with projecting teeth are held in alignment on a truss with spiral nails. The truss then passes through a pressure roller or punch press which squeezes the teeth and nails into the wood. A roller press, usually preferred, costs \$2,500 to \$2,600. Pressure-only plates have saw-like teeth for extra holding power. The equipment for this process of manufacture is more costly.

Nailed-glued trusses, using plywood gussets, are used less than the other two. This system requires fabrication under controlled atmospheric conditions, favorable to the glue work.

Trusses are not the only method of spanning roof space. For flat roofs, laminated beams and plywood box beams are often called upon to carry the load. The box beams are not unlike those used in floor construction (chapter 2). For exposed roof beams, the plywood surfaces can be of fine hardwood. Laminated beams also present a handsome appearance when exposed, and this type of structure usually leaves them open to view. Both types have distinct advantages over solid timbers of similar dimensions.

These beams have good load-bearing strength, and thus call for roof material that will span the considerable spacing between them. Two-, three- or four-inch thick insulating plank decking is gaining increased usage for this purpose. It has excellent insulating value, offers a finished ceiling as soon as it is laid, and a top surface suitable for a built-up roof.

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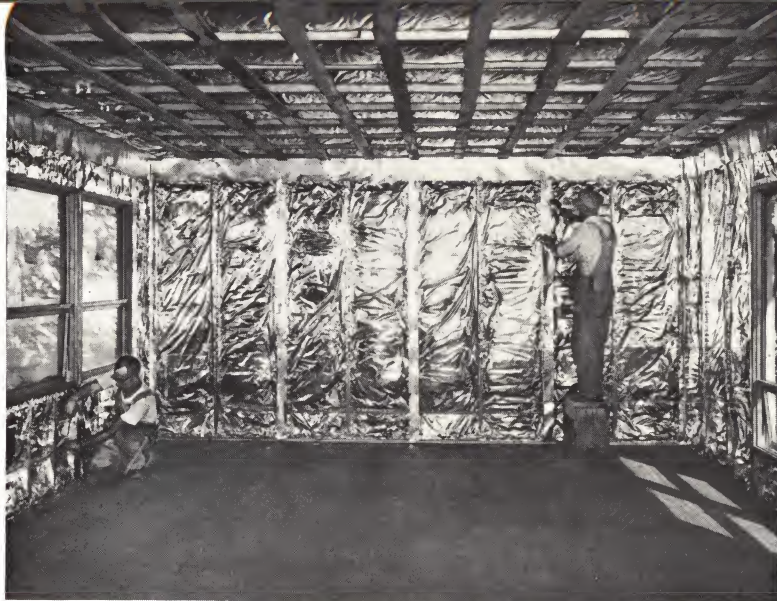
*Information about laminated beams and wood decking is available from these manufacturers, among others:*

*Pottlach Forests, Inc., Warren Ark.; Unit Structures, Peshtigo, Wis.; and Rilco Div. of Weyerhaeuser Co., First Nat'l Bank Bldg., St. Paul 1, Minn.*

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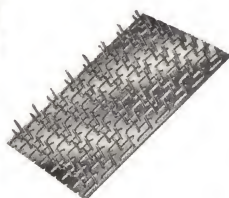
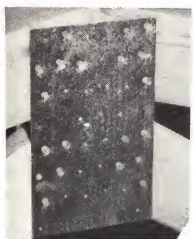
Roof decking is also made in a variety of wood species by a number of lumber manufacturers. It is usually 3x6 and 4x6 material, pre-drilled for spiking to beams. It is carefully selected for fine appearance when left exposed on the underside, and serves the multipurpose of sheathing, insulation and decorative ceiling. It is usually double-tongued and grooved.





With truss construction, insulation of all exterior walls and roof is more easily done before partitions are erected to divide the space.

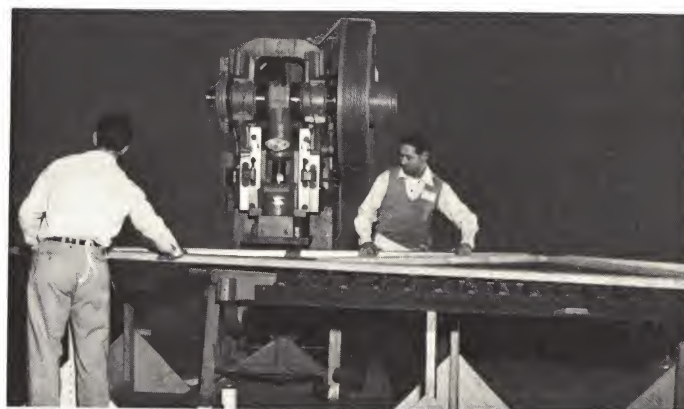
The ceiling and finish floor in this truss roof house have been installed before closet and other partition framing was erected. This avoided a multitude of cutting and fitting problems.



Truss plates of several types left to right: nailed only, two types of nailed and pressure plates, and H-Brace plate.



Plywood gusset trusses, glued and stapled.



Punch press for driving home nailed-pressure plates.



Roller press for embedding nailed-pressure plates.





Box beams (above) and glue-laminated beams (below) used to support flat roof decks.



Curved stressed-skin panels can span even greater distances and offer fine appearance. They are most often used on commercial structures.



Stressed-skin panels incorporating insulation, spanning eight-foot beam spacing.





Stressed-skin panels, similar to those described in Chapter 3, are also used to bridge beams or trusses spaced up to 19 ft. 10 in. They can be insulated and ventilated within the panel.

*Issued by Douglas Fir Plywood Assn., Tacoma 1, Wash., Booklet F59-1030A gives all details on stressed-skin panels.*

The following two systems are usually limited to commercial applications:

Folded roof plates are essentially stressed-skin panels which can span up to 100 ft. while eliminating the need for trusses, beams or any other framing support members. The units are erected on posts at either end of the structure, spaced up to 20 ft. They offer a saw-tooth pattern by bracing themselves against each other.

*Douglas Fir Plywood's form F62-1020 provides complete details on folded roof plates.*

Visually handsome curved panels with a relatively thin profile, can span up to 32 ft. They can be formed with a solid plywood core, with lumber or plywood ribs, or with a paper honeycomb core.

*Douglas Fir Plywood's bulletin 59-1040A gives details on curved panels.*

Builders who wish to ease their way into the component form of construction will discover gratifying savings at the very outset by embracing one or more of the roof systems suggested above, especially truss roofs. Dealers will also find trusses a logical place to start their component business, although it is now the most competitive area of components. Experience with a new roof should supply ample encouragement to dealer or builder to proceed with further adoption of component construction in other areas of the home.

## TRUSS PLATE BRANDS

**Denver Wood Products Co.**  
1945 West 3rd Ave.  
Denver 23, Colo.

**GISMO GUSSETS**  
Truss Prefab of Canada  
10 Vulcan St.  
Rexdale, Ont., Canada

**GANG-NAIL**  
Automated Building  
Components, Inc.  
7525 N. W. 37th Ave.  
Miami 47, Fla.

**DURA-PLATE**  
Duratite of Ohio, Inc.  
2240 Hayes Avenue  
Fremont, Ohio

**H-BRACE WITH SELF-CLINCH NAIL**  
H-Brace, Incorporated  
3930 N. W. 25th St.  
Miami 42, Fla.

**HYDRO-NAIL**  
Hydro-Air Engineering, Inc.  
1317 S. Vandeventer Ave.  
St. Louis 10, Mo.

**PENHURST CONNECTOR PLATES**  
Penhurst Machine Co.  
1339 East 289th St.  
Wickliffe, Ohio

**RONEL BARB-GRIP**  
Ronel Corporation  
Box 1265  
Opa Locka, Fla.

**SANFORD GRIP-PLATE & GRIP-MASTER**  
Sanford Truss, Inc.  
Box 1177  
Pompano Beach, Fla.

**TEMPLIN TRUSS-LOCK**  
Templin Associates, Inc.  
Box 1917  
Vero Beach, Fla.

**UNITED TRUSS & BURKE TRU-RAF**  
Truss Connectors of America, Inc.  
7100 Coral Way  
Miami 55, Fla.

**TRUSS-O-MATIC**  
Truss-O-Matic, Inc.  
166 East Erie St.  
Chicago 11, Ill.

**GISMO GUSSETS**  
Truss Prefab, Inc.  
Box 113  
Colorado Springs, Colo.

**HANSEN TRUSS PLATE**  
Hansen Truss Plate Corp.  
P.O. Box 6606  
West Palm Beach, Fla.



## PARTITIONS

In component construction it is all very clear. The egg must precede the chicken. Roof structure which carries roof load to exterior walls is the prelude to complete freedom in the division of space within the house, and use of less costly, non-load-bearing partitions.

Jig-formed partition framing is one method which has introduced certain efficiencies into interior partitioning in the past. However, it is in this area, as well as in exterior window panels, that the goal of all component enthusiasts has first been realized. Now available to and through building materials dealers are interior partitions with the precision advantages and economies of large scale factory-made techniques.

STRUCTICORE® partition panels by United States Gypsum are 4x8-ft. units combining two finished surfaces of SHEETROCK® gypsum wallboard, factory-laminated to a center core of vertical fiber tubes and 2x3 plates at top and bottom. With a minimum of cutting, inside or outside corners can be created. Electrical or plumbing lines can drop from the ceiling or come up from the floor through the open tubes, for rapid roughing-in of these facilities. In addition to installation time economies (Chapter 1), finishing time is also reduced because elimination of nails practically eliminates spotting.

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*For full details on STRUCTICORE partition panels call the nearest United States Gypsum district office, or write the company at 101 S. Wacker Dr., Chicago 6.*

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Combine these partitions with ceiling-high doors, and job-site efficiency really climbs. Doors 7'11" high are offered in many surfaces. They need not be costly so long as their height is within the standard eight-foot length of most sheet materials used to surface them. Eliminating the need for headers and for finishing the area between the top of the normal door frame and the ceiling saves installed cost of at least \$5 per opening.

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*More information about ceiling-height doors is available from: Simpson Logging Co., 2301 N. Columbia Blvd., Portland 17, Ore.*

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Even the building materials dealer who has no other present interest in producing components can develop a

nice business in pre-hung doors by obtaining them from a distributor or by installing equipment to permit him to provide this service (see Chapter 7). The capital investment is modest, and builders large and small, conventional and panelized, can easily be interested by a demonstration which reduces his on-site door installation labor from an average of two man-hours per opening to 15 minutes per opening. The precision fit and fine workability of a door installed under controlled shop conditions are further advantages. Pre-hung doors may also be purchased by dealers from millwork wholesalers who have assembled them from factory-prepared parts.

Storage walls are multi-purpose units which carry the components idea at least one desirable step further. They combine a space division function with a storage function. The units have sales potential for a lumber dealer, not only as part of his house package, but also for the home improvement market. With simple mill facilities, the dealer can fabricate his own storage walls and add to his gross on the materials involved. Or such units can be purchased K. D. from any one of several large millwork factories.

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*Plans for developing locally-made storage walls are available from POPULAR HOME IDEAS magazine, 101 S. Wacker Dr., Chicago 6, Ill. or: Small Homes Council (Bulletin C5-11) University of Illinois, Urbana, Ill. Complete units may be obtained from: Davidson Wall, Southport Lumber Co., Southport, Ind.*

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•T.M. Reg. U.S. Pat. Off.

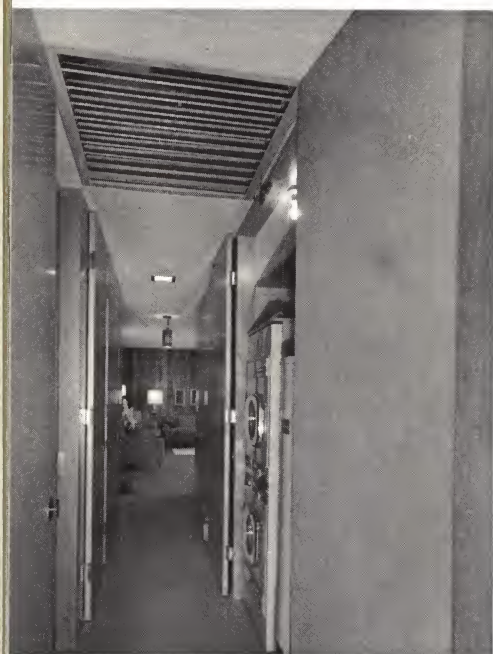




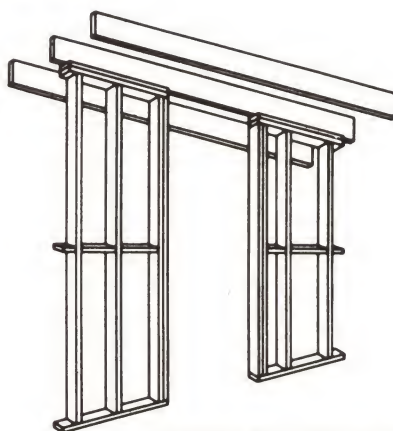
Factory-made (STRUCTICORE) gypsum partition panels include two faces of gypsum wallboard laminated to a fiber tube core. They slip into place quickly and easily and permit remarkable installation savings.



Storage walls can serve the dual function of dividing space and providing necessary storage that is engineered to a family's needs.



Ceiling-high doors eliminate the cost of cutting and installing headers, whether or not they are hung in conventional fashion, or with the surface-mounted hardware shown here. With surface mounting, the door need not fit within an opening.



Framing for ceiling-high doors is simplified, as shown.



## MECHANICAL UNITS

THE Lumber Dealers Research Council has inspired and executed the development of a mechanical core, conceived for fabrication by the local retail building materials dealer in his panelizing shop. He will bring licensed plumbers, electricians and tile setters into his shop to fulfill their functions under controlled and efficient conditions. It is one of the first answers to the building industry's plea for increased efficiency in plumbing.

The mechanical core is a three-dimensional unit that encompasses the most expensive part of the house, for it contains the largest variety of trades and materials. The Research Council's L.D.R.C. core unit can include the furnace, the hot water heater and master electrical panel. In addition, the kitchen is complete with cabinets, sink and other desired accessories. The bath or baths include installed ceramic floor and wall tile, medicine cabinet and bath accessories, doors hung and all surfaces decorated.

In short, the core is a pre-planned, finished section of the house that is made in the lumber yard and hauled to the building site under supervision of the retail lumber dealer. With it the dealer provides a packaged mechanical installation with higher quality and at less cost to the builder and consuming public than with conventional methods.

The real benefits to the retail lumberman and his activities are several:

By manufacturing the core in the yard, the sale of items such as ceramic tile, medicine cabinets, wallpaper, bathroom accessories, vanities and drop-in appliances is retained by the dealer. Those items may not now be in the dealer's stock, but they could and should be, to carry the package as near as possible to completion.

Since this unit brings the work of several trades to the job complete, many scheduling delays are eliminated. For instance, to make the unit functional on the site, the plumber needs only to connect the cold water supply and waste pipe, and extend the vent stacks through the roof line. No job delays are encountered with the tile setter. His trips to the site are eliminated or minimized,

as are decorating and door-hanging functions.

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*A booklet on the core has been prepared by Lumber Dealers Research Council, Ring Bldg., Washington, D. C., along with a guide to reasonable man-hour requirements for plumbing, electrical and other outside trades. These costs have shown remarkable reductions in the Lu-Re-Co experience with the cores. Working drawings for four core units are also available from Lu-Re-Co for \$35.*

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Scheduling of electrical work is simplified. The unit is completely wired, light fixtures hung and switch plates installed. At the site, outside power service is merely brought to the electrical panel, and this portion of the unit becomes functional. Additional circuits for partitions and exterior wall outlets are tied into the panel in a minimum amount of time. Accumulated, these items can trim as many as five or more days from the construction period. Plans for a more modest core containing two bathrooms without kitchen, are also available.

Structural parts of the core are fabricated with plywood, glued and nailed to framing. The "box" has proved exceptionally rigid, and even the largest of units has been hoisted, trucked, set in place and returned to its point of origin without so much as loosening its ceramic tile from the walls and floors.

Dealers who are not yet ready to take the full step into production of mechanical cores as described above can take partial steps in this direction. For example, they can merchandise shower bases and shower stalls, factory-fashioned in plastic such as those offered through Owens-Corning Fiberglas Home Building Products Division.

At least one company is roughing-in plumbing under factory conditions and producing a plumbing partition which they feel saves builders \$150 to \$400 per house, even when shipped many hundreds of miles. The company offers 16 basic layouts (32, when reversed) featuring different combinations of fixtures on either side of the partition, and will custom design a partition on order of ten or more duplicates.

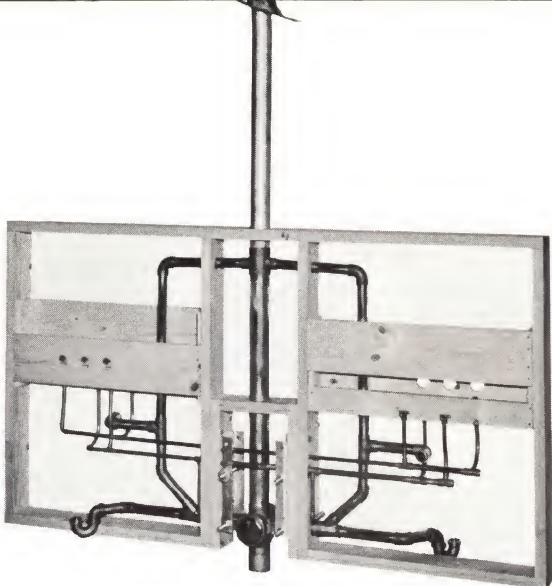
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*Full information on the plumbing wall is available from Apsco of Indiana, Inc., 10th St., Baer Field, Ft. Wayne, Ind.*

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In one sense, heating has always been a component contribution to housing. The modern furnace or boiler





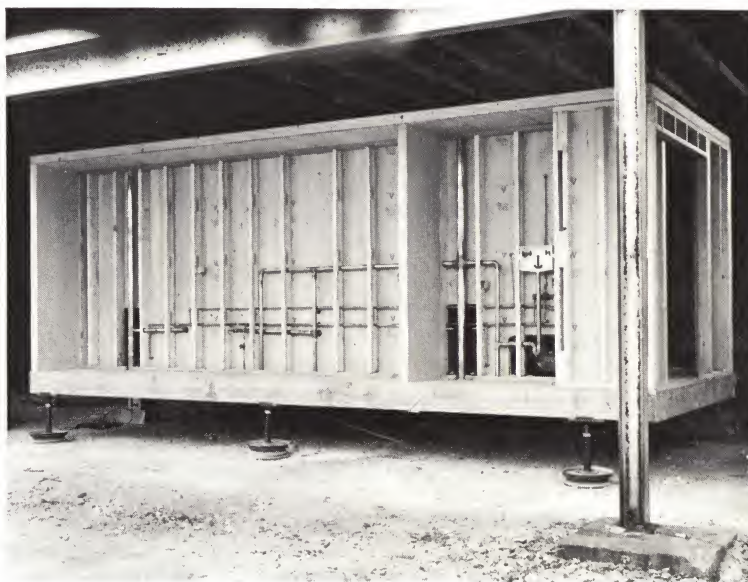
Made in 32 different standard versions, this roughed-in plumbing wall has been saving dealers and builders money. It is produced by Apsco of Ft. Wayne, Ind. and supplied with or without fixtures.



Molded plastic shower stall by Fiberglas division of Owens-Corning.



Large Lu-Re-Co plumbing core is lifted with two fork trucks while highway flatbed is backed under it.



Structure of plumbing cores is rigid, nailed-and-glued plywood shell fabricated in dealer's shop. Plumbing contractor, tile setter and electrician all come to dealer's shop to do their work under controlled conditions.



Because of the rigidity of the nailed and glued framing, core survived two or three separate handlings without so much as a single ceramic tile having to be replaced.



packages a scientific heating and cooling source as a pre-manufactured unit. Using a crawl space for plenum also "packages" the heat distribution system.

Several companies are offering factory-wired furnace systems which can be installed by the builder with no more than a screwdriver. Because the mechanical guarantee on these units usually goes directly back to the manufacturer, lumber dealers can sell them. Service calls can generally be handled by local heating people, with charges covered by the factory guarantee.

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*The Small Homes Council at the University of Illinois, Champaign, Ill. has a splendid bulletin on heating systems that can be of great interest and aid to dealers and builders.*

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Prefabricated chimneys reduce pieces and time required for assembly for this unit, in areas where up-to-date codes permit their use. Factory-built central cores for fireplaces offer foolproof draft conditions and maximum heat output for a fireplace. Their penalty is usually a larger finished unit than normal.

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*Information about chimney units can be obtained from several manufacturers: Condensation Engineering Corp., 3511 W. Potomac Ave., Chicago 51, Ill. Van Packer Products, 30 Rockefeller Plaza, New York 20, N.Y. General Products Co., Fredricksburg, Va. Majestic Co., 516 Erie, Huntington, Ind. Metalbestos Div., William Wallace Co., Box 137, Belmont, Calif.*

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Electric heat promises the longest stride toward a component heating program. Soon to be marketed is a heating panel, for installation as a ceiling, similar to the normal gypsum wallboard double-layer ceiling. Installed cost savings are phenomenal, and heat is clean and completely controlled by occupants. Until release of this product, base-panel electric heat complements component construction by minimizing need for cutting and boring in component panels for heating system installation.

The mechanical parts of a house offer some of the greatest opportunities to benefit from component methods of construction. Building materials dealers and builders can do much to bring about savings and pioneer methods which introduce greater efficiency to this important phase of the building picture.



Crane and sling eases plumbing-heating core into place on foundation and footings.



## EQUIPMENT FOR COMPONENT CONSTRUCTION

COMPONENTS have created new opportunities for dealers and have also made some new demands upon them. For example the dealer has had to broaden his management thinking to embrace a small scale manufacturing function in addition to his traditional merchandising function.

The new responsibilities include planned production flow, shop layout, solutions to new handling and delivery problems for larger units, as well as new techniques for package selling to builders.

This enlargement of functions for the dealer is one reason why it is so frequently urged that adequate management personnel be assigned this area of the operation as a specialized responsibility. Unless the present organization includes a man versatile enough to adjust his former concepts of builder sales to this new package technique, it is advisable to seek management for this department outside of the present organization.

Manufacturers of shop machinery and handling equipment are prepared and willing to aid dealers in developing solutions to many of the new problems they face when they enter component construction. United States Gypsum also has a staff of experts to serve its customers with suggestions on these matters.

Pre-cutting of materials continues to be a prize element in the production of homes, whether they go to the construction site assembled as components, or as pieces to be job-assembled without cutting. For years, dealers have used saws of various capacities to accomplish this pre-cutting, and many continue to use this same equipment for cutting when they enter component construction. However, the profit squeeze and the lack of trained personnel encourage dealers with growing volume to install "automatic" cutting equipment that increases production and accuracy.

These precision truss cutters and component cutters range in cost from \$6,000 to \$12,000 depending on optional attachments and degree of automation desired. The largest can precut all parts for 20 standard 4/12 - 24 ft. trusses in one operational hour. The capacity for precutting floor systems, wall panel parts, etc. is proportionate.

In addition to speed, the value of these precision machines is apparent when parts they produce are put into assembly jigs for fabrication. The precision fit of identical components is a great satisfaction and time saver, whether they are for floors, walls, trusses, gable-ends or interior partitions. But their capacity requires large market demands to keep such machines busy, and their cost demands that they be busy almost continuously.

Jigs for 4x8-ft. panels made by the Lu-Re-Co system can be built by the dealer from plans supplied, for amounts varying up to a maximum of \$200. A commercial jig with the added convenience of roller take-off and quick-release clamps is available for about \$495.

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*Lu-Re-Co jig made by Clary Corp., Box 562, Ft. Worth, Tex.*

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Another precision-manufactured unit with many accessories is the Q-system jig. This jig is included in the system purchase price, and takes care of all variations in panels required to complete the wall structure of a house.

All jigs described above are at working table heights to reduce worker fatigue; materials are stored adjacent to the work area to reduce time in loading the jigs; standardized parts reduce supervision time; small tools are conveniently located for easy access; these and many other advantages are a product of the component idea.

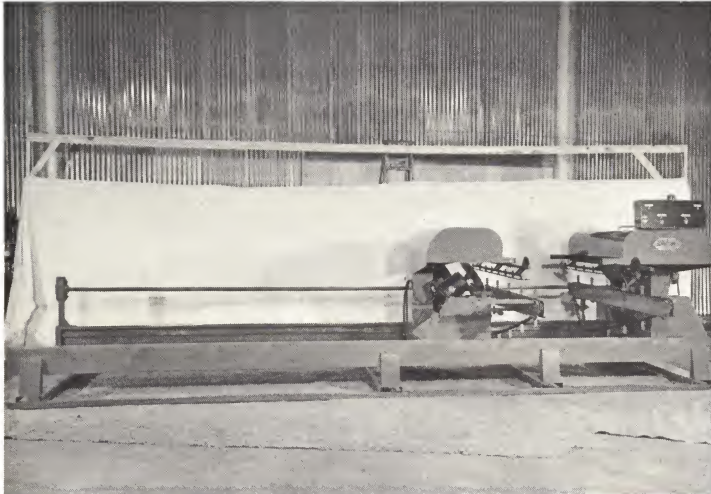
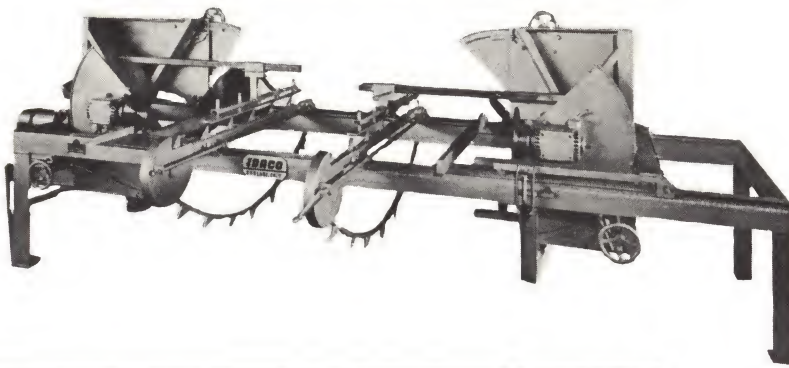
As the oldest and most widely used component, trusses have become highly competitive. In large markets some truss-makers manufacture on a very high volume basis and sell at a very low profit margin per unit. However, a smaller-volume retail lumberman can manufacture trusses and gable-ends in his own yard to complete materials packages he is assembling for builder customers and, through package-selling methods, be competitive.

A jig of some magnitude is necessary to control precision for all single plane trusses. Most truss plate manufacturers have, as part of their sales and services, truss jig hardware, plans, etc so that a dealer can make his own jig, tailored to his available space. At the other end of the scale is a \$1300 automated flip-over jig that is air actuated.

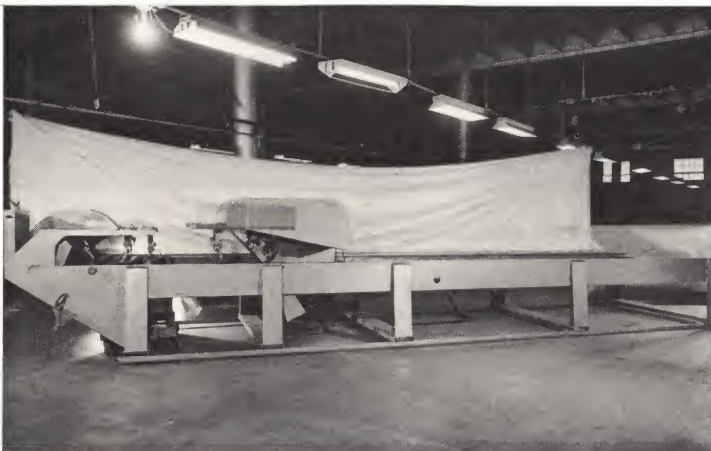
Small tools, both muscle- and air-powered, add to the



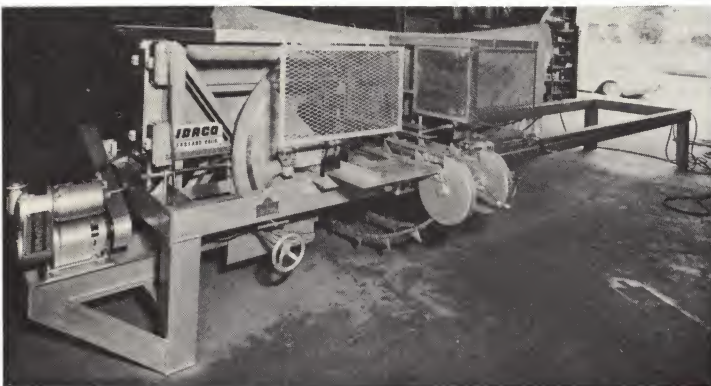
Truss parts cutter by Idaco is said to cut 85 pieces in five minutes, formerly a one-hour job. It cuts four angular cuts at a single pass, and handles 2x4's from 14 in. to 22 ft. long.



Clary Lumbercraft, a moderate cost machine, will cut over 600 component parts per hour with 1/32-in. accuracy, according to its manufacturer. Compound angle cuts and short angle cuts are made without patterns, and with negligible set-up time.



Clary's large component cutter can turn out as many as 600 trusses in an eight-hour day. It will cut all parts for W trusses, king post trusses, window openings, door openings, rafters, studs, joists and other dimension material. Cuts are accurate to 3 minutes of one degree, and pitch change can be made rapidly without changing length. It is said to do the work of 16 men, at a total cost of approximately \$12 per day when financed over three years.



Component cutter by Idaco, having capabilities similar to those of Clary unit.



rapidity of building components. Great progress has been made, for example, by manufacturers of fastening machines used to power-staple or -nail truss plates of plywood or metal, sheathing of all sizes and descriptions, floor underlayment, ceiling tile, door jambs, lath, asphalt shingles, etc. These multi-function tools are used in conjunction with other hand tools that are required to fasten structural framing members together. Hand tools that drive up to a 16d nail are now gaining wide acceptance after a slow start. They are made and sold by:

WILSON HOMES  
P. O. Box 6037  
St. Louis, Mo.

SUPERIOR PNEUMATIC & MANUFACTURING CO.  
13808 Enterprise Avenue  
Cleveland, Ohio

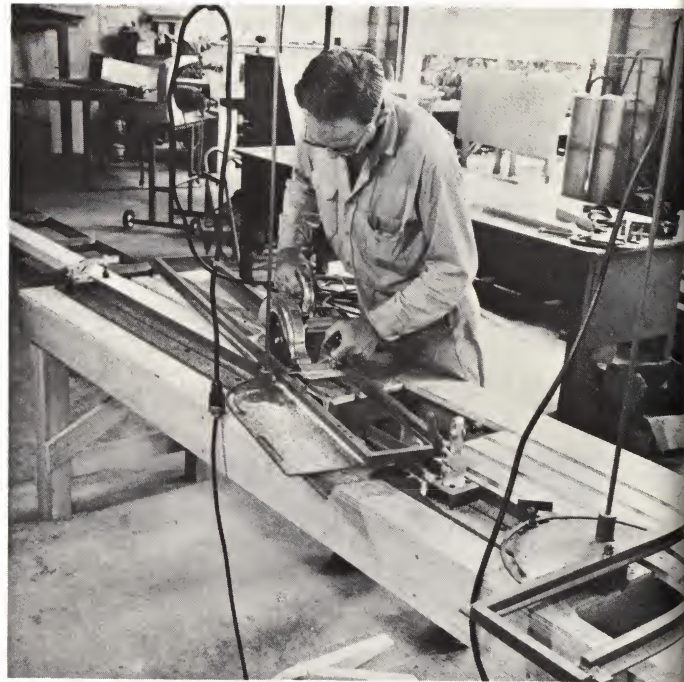
UNITED SHOE MACHINERY COMPANY  
Boston, Mass.

For accurate low-volume production, the Double Slide cutting assembly for roof trusses pictured here has entered the market. The most difficult cut to make on trusses is the bottom chord heel cut, particularly those for roofs with less than 4/12 pitch. The Double Slide is also adequate as a panel saw for sheet materials, plywood gussets, etc. Information is available from the manufacturer: H-Brace, Inc., 3930 N.W. 25th St., Miami 25, Fla.

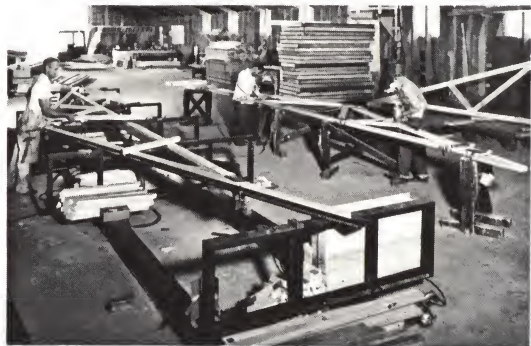
### Handling Equipment

For delivery of components, many varied pieces of equipment can be used. The simple, home-made truss cradle will hold enough trusses, plus two gable-ends, for the average size house, and has these advantages.

1. Serves as storage rack during manufacture.
2. Holds gable-ends for prime painting before delivery.
3. It can be loaded onto a truck by fork lifts.
4. When dropped at the site it absorbs the shock and eliminates truss damage. Unit unloading frees delivery truck and driver in minutes.
5. Provides truss storage at job site allowing delivery prior to actual need.



Simple and inexpensive guide for hand-held power saw, used to achieve complex angle cuts with accuracy (manufactured by H-Brace).



Simple adjustable truss jig for single plane trusses. Bench at right merely supports truss while nailing plates are fixed to the second side of the truss.



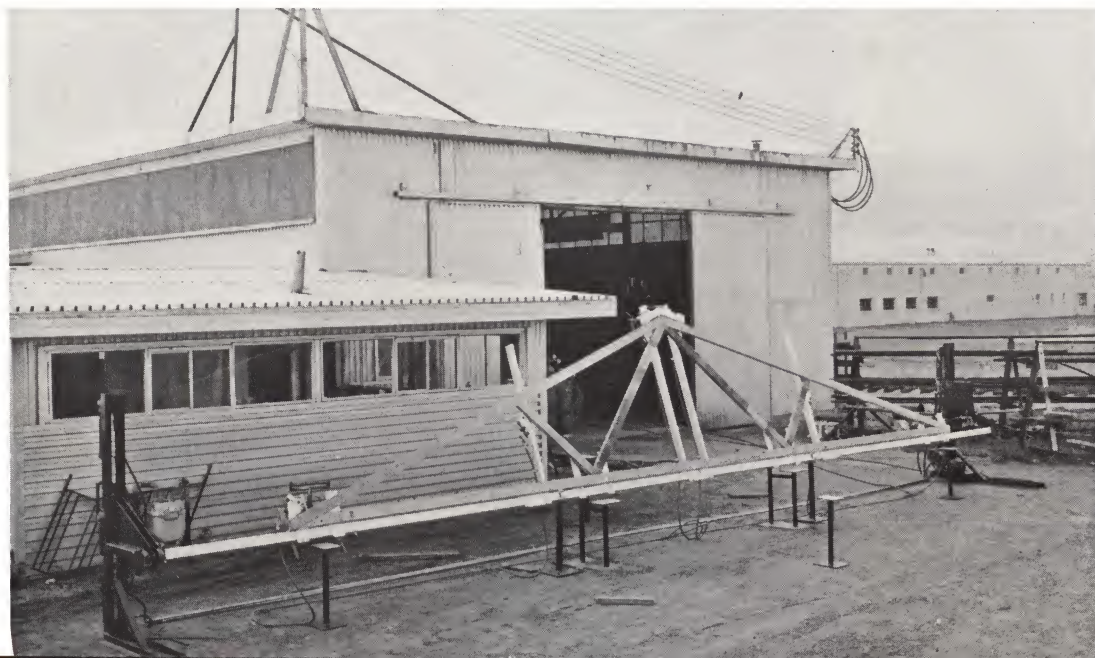


Tilto-matic jig by Bettendorf Distributing Co., Box 795, Bettendorf, Iowa, flops truss by power without releasing it from the jig, for nailing on the second side. Wall panel jigs are shown on the cover and with chapter 3.

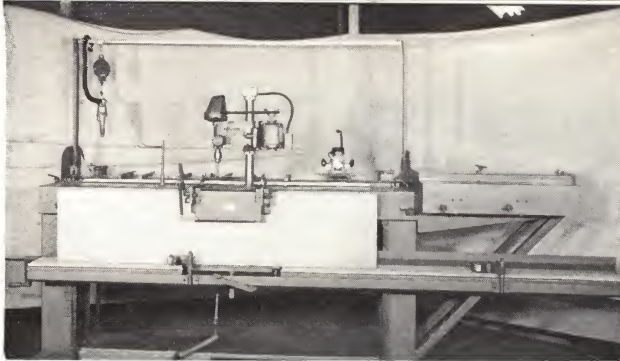


Roller press by Idaco for cinching truss plates into the lumber.

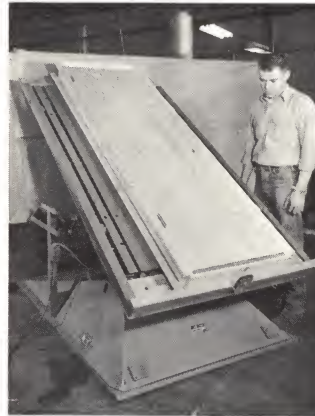
Roof truss fabricating table made by Truss Prefab, Inc., 3150 N. Century, Colorado Springs, Colo., is said to fabricate 160 trusses per day with three men. It is quickly adjustable to position lumber for trusses up to 40 ft. long, with roof pitches from 1/12 to 6/12. Air cylinders press from inside to snug members to top and bottom chords where dimensions should be constant. The units rotates 180 degrees for nailing plates or gussets on both sides.







Principal machine at a pre-hung door plant is a fabricator that sizes and bevels a blank or lightened door, drills lock and piston holes, mortices jamb and door for necessary hardware, and holds door in place for accurate attachment of this hardware. Clary's Doorcraft III (pictured) is such a machine. A jamb and stop machine, a mitre and splines and an assembly machine (pictured) complete a fully automated door shop.



Simple truss rack, loaded by lift truck onto flat bed truck. Entire rack slips off back of truck and provides storage for trusses on job site.



Jack Rabbit Truss Trailer by De Kalb Body Corp., De Kalb, Ill. handles up to 38 trusses—17 ft. to 32 ft. long. One man gently unloads trusses as a unit.

Low cost, hand-operated truck-mounted crane elevates three or four trusses to roof simultaneously.





6. Empty rack can be loaded by hand for returning to the yard.

*Plans for constructing truss cradles are available from: Lumber Dealer's Research Council, Ring Bldg., Washington, D.C.*

Low cost farm trailers are used extensively for truss delivery. Wall panels are loaded on the truck which pulls the farm trailer. Any welding shop can make the required stanchions over the bolsters, and with the long coupling pole the distance between the bolsters can be changed to accommodate different lengths of trusses.

Some dealers have gone much further by attaching cranes to their tractors; used low-boys, converted auto carriers, or specially-made truss trailers for delivery purposes. At the job site the crane unloads trusses directly to the roof where they are positioned by the builder's crew.

*Truss cranes manufactured by Stanco Mfg. & Sales, Inc., 1666 Ninth St., Santa Monica, Calif.*

Perhaps the handiest equipment yet is the truss spacer, with which the crane lifts a number of trusses from the truck, all properly spaced for nailing into position. Three or four lifts put roof framing completely in place for an entire house.

Jigs and truss presses manufactured by:

IDACO  
3233 Peralta St.  
Oakland 8, Calif.

CLARY CORPORATION  
Box 562  
Ft. Worth, Texas

ANDERSON ENGINEERING & MFG. CO.  
203 S.W. 28th St.  
Ft. Lauderdale, Fla.

MARWEST STEEL CO.  
3100 N. Century  
P.O. Box 113  
Colorado Springs, Colo.



Power-activated truck-mounted crane for hoisting trusses from truck bed to roof.





Power nailer or stapler such as this one made by Spotnails, Inc., Rolling Meadows, Ill., is useful in the shop or on the job.



## FORECASTS & CONCLUSIONS

EVER since the postwar home building boom evaporated, the building industry has been licking its chops with anticipation as it awaits the arrival of the war babies. Perhaps some builders and dealers feel that the good old days, when anything sells, will return as soon as this bumper crop of young Americans begins to marry and establish homes. They will be disappointed.

Those who are more realistic are equally sure that the big market *will* return to homebuilding, but are candid in recognizing that in many respects it will be a different market with different values and different buying habits. Builders and dealers who will savor success then, are attempting now to appraise and predict the nature of this new market, and adjust their own operations to take full advantage of it.

They know, for example, that the new generation of newlyweds will be no more affluent than were their parents at that age. In fact they will have no nest-egg of hoarded army pay nor liberal VA-financing as an ace up their home buying sleeves. Their cry will be even more poignant than was that of their fathers: "How much house can I get for my money?"

The industry's answer is now in preparation. Those that have it ready at the time of the great market release will reap the major rewards. The answer that appears most likely at this time is component construction. Not all of those who are making or selling components now are

profiting from this business. Yet not one who is in it considers withdrawing from components. Having tried it, they are convinced that it *is* a better way to build, and they are willing to wait for the market to catch up to them, knowing that their rewards will be great.

Many of those component makers currently showing significant profits have multiple outlets for the products of a single component shop. Line yard operations are the best example. Having control of a number of retail outlets, they don't have to wait for the managers to make up their minds to try components, as does a distributor who is at the mercy of his dealer-customers.

Arrayed behind the component idea is a formidable cross-section of industry influence, based on conviction. Much of United States Gypsum's product research and marketing plans are pointed in this direction, and the company has reason to believe that other manufacturers are treading the same road. The industry's press has been championing the components theme for several years and industry associations have organized such groups as the Lumber Dealers Research Council to provide methods and know-how to their members for the movement toward components.

Component construction must be more than a fad. Today it is the only clear road to the lower costs that must come to the building industry. Come join the revolution!



## **OTHER U.S.G. ADVISORY SERVICES**

United States Gypsum believes that a manufacturer's success is measured in broader terms than sales and profits. The truer measure is the contribution made by the company to the growth and prosperity of its customers and the industries in which it participates. To that end, the following service programs have been produced by U.S.G. to assist dealers, home builders and other trade factors in the construction industry.



**Profit Management**—A full-color film and book outlining the major principles of effective business management in a retail building material business.

**The Economy of Motion**—A full-color movie and manual presenting a study of materials handling, primarily for building material dealers.

**Teamwork for Profit**—A training program, prepared as three workshops, to improve employee attitudes and stimulate employee productivity. Workshops are conducted by the manager of the building material business.

**Customers are People**—A training program for dealers' use to teach their employees the principles of professional salesmanship; a program developed as the first unit of the National Retail Lumber Dealers Association's Sales-Maker Program, available through NRLDA, Washington 6, D.C.

**Basic-Bilt**—A complete marketing program, designed to help dealers and builders in the fast-moving, semi-finished home construction market.

**A Blueprint for Profit**—A full-color movie and manual presenting the major business management problems faced by home builders, with stimulating ideas for guarding and improving profits.

**Financial Management Workshops**—A series of three workshops for home builders, covering the details of Accurate Estimating, Profit Planning and Budgeting, and Expense Control.

**Sales Training Workshop**—A three-hour meeting to teach new home salesmen the basic sales techniques which help sell more homes faster and at the planned price.

**Building the American Dream**—A 30-minute, full-color motion picture relating the remarkable progress of the

home-building industry, as an ideal public relations tool for use with consumer groups.

**Drywall Age**—A 15-minute sound-slide film presentation depicting the recent strides of drywall construction, for use with architects, general contractors and finance agencies.

**Drywall Takes a Giant Step**—A 15-minute sound-slide film illustrating new systems and usages for drywall construction in commercial buildings.

**The Man Who Wouldn't Wait**—A color movie and textbook demonstrating how drywall contractors can improve their volume by promoting product and workmanship, without entering into price competition.

**Bidding for Profits**—Textbook manual detailing the basic principles of successful gypsum drywall job estimating and cost control.

**What Can One Man Do?**—A sound-slide film, with manuals, designed to stimulate aggressive selling on the part of lathing and plastering contractors.

**One Man Can Do Plenty**—A film and manual program to show lathing and plastering contractors the professional approach to getting business.

**Sound Control in Design**—A full-color film, with textbook manual, depicting the history of sound control and the need for architects to understand the control of sound in today's buildings.

**Distributor Sales Training Workshop**—A thorough basic course in salesmanship, packaged for use by a distributor's management, to teach effective selling to salesmen.

All of these U.S.G. advisory services are available to building material dealers, home builders, and other trade factors, through the local U.S.G. representative.



